# Dental

# Abstracts

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*A selection of world dental literature*

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SECTIONS



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Anatomy

## Radiodontic study of the mental foramen

A. Porter S. Sweet. *D.Radiog.& Photog.*
32:28, 32-33 No. 2, 1959

Although the mental foramen is of considerable importance to the dentist, textbooks of anatomy contain only scant and misleading material on it.

A study was made of consecutive periapical full mandibular roentgenograms of 585 employees (160 women and 425 men) of a large manufacturing concern. The ages of the subjects ranged from 18 to 64 years, the average being 32.19 years.

The mental foramen could be visualized on both sides of the mandible in 43.07 per cent of the films, and on one side in an additional 24.27 per cent. In men, the mental foramen was disclosed more easily until the age of 35 years; after this age, it was increasingly difficult to visualize the foramen. In women, the mental foramen was difficult to visualize from the earliest ages.

Parallax is one of the complications of locating the mental foramen on a roentgenogram. In making a roentgenogram of the lower bicuspid region, the standard angle of projection is minus 10 degrees. There is thus a tendency to cast the image of the foramen higher up on the film than it actually is (Fig. 1). This would account for some, but not all, of the instances in which the foramen is recorded at or above the apex of the nearest tooth.

Since the central ray (CR) in Figure 1 is directed to the center of the film packet (F) from an angle below the horizontal, the roentgen rays will throw the shadow of the foramen upward so that it will strike the film at A, rather than at B, where the shadow would fall if the rays were projected horizontally. The vertical distance between A and B thus is the amount of error caused by parallax.

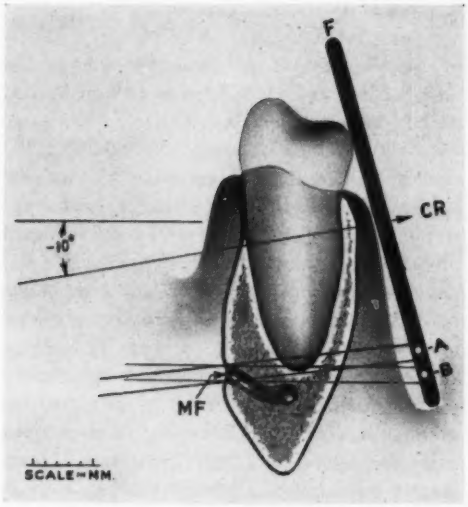


*Figure 1 Diagram showing parallax in roentgenography of the mental foramen. CR = central ray, MF = mental foramen, F = film packet, A = position of shadow of foramen on film, B = actual location of foramen in relation to tooth. The difference is due to parallax caused by the 10 degree angle between the film packet and the long axis of the tooth*

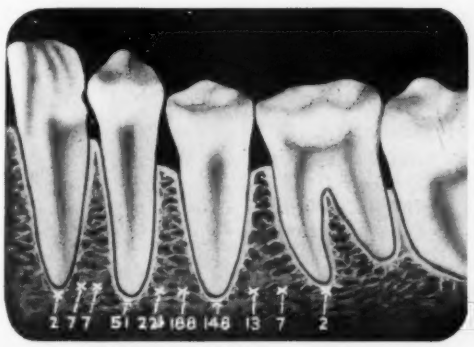


*Figure 2 Location of mental foramen in 646 foramens. Each figure represents the number of times the foramen was located at the site indicated*

In this study, of 646 foramens recorded, only 148, or 23 per cent, were located at the apex of the second bicuspid, considered by anatomists as the normal position of the foramen. The other 498, or 77 per cent, were recorded over a wide area (Fig. 2).

Of 646 foramens recorded and corrected for parallax, 530 (82 per cent) were located below the apex of the nearest tooth but not in as precise a location as anatomists would have us believe. Of the remaining 116 foramens recorded, 72 (11.1

per cent) were located above the apex of the nearest tooth, and 44 (6.8 per cent) were located at the apex of the nearest tooth.

Of 646 foramens recorded, 132 (involving 113 subjects) might have been misinterpreted; 37 were nearest the first bicuspid and 95 nearest the second bicuspid. Since there were 1,170 foramens present which might have been recorded, this possible error represents 11.28 per cent of the total and 20.43 per cent of the number of foramens actually recorded.

Fourteen potentially misinterpreted foramens are of special interest, for they might have been misinterpreted for the following reasons: small and indistinct, 2; very large, 1; overcast by a large area of osteoclasia, 1; located between roots of two bicuspids, 1; located at the apex of the alveolus of extracted second bicuspids, 6, and located at the apex of a bifurcated root of a second bicuspid, 3.

Care always must be exercised in interpreting roentgenograms of the lower bicuspid region, for in about one roentgenogram in five there is danger of misinterpretation. In addition, there are anomalous conditions of the foramen which might be misinterpreted.

*X-ray Division, Eastman Kodak Company, Rochester, N.Y.*

## Changing concepts of the supporting dental structures

Harry Sicher. *Oral Surg., Oral Med. & Oral Path.* 12:31-35 Jan. 1959

Concepts regarding two of the dental supporting tissues—the epithelial attachment and the principal fibers of the periodontal membrane—have changed in recent years.

After Gottlieb, more than 35 years ago, had described the attachment of the epithelium to the enamel and, in later stages of eruption, to the cementum, this concept was accepted by most investigators. Many years ago, however, Weski had proposed a different idea of the mechanism of this attachment. Whereas Gottlieb had described the secondary enamel cuticle as a layer of a keratoid substance, probably the product of the attached epithelial cells, and had supposed that this secondary cuticle was produced by the epithelium as a protective layer before the epithelium detached from the surface of the tooth in "passive eruption," Weski thought that this hornlike layer represented a cementing substance binding the epithelium to the surface of the tooth.

A few years ago Waerhaug reopened the question of the epithelial attachment. He denied the attachment of the epithelium to the tooth and returned to the old concept of a potential space, a pocket, extending from the gingival margin to the cementoenamel junction from the time the tooth had erupted into the oral cavity. Although Waerhaug based his findings on many experiments, repetitions of these procedures by Orban and others have shown that Waerhaug's observations were not correct. Gottlieb's discovery still stands. The epithelium is attached to the tooth.

One concept had to be changed. The epithelial attachment must be considered as one part of the dentogingival junction. Just as the gingiva consists of the bulky, firm, resistant, fibrous connective tissue and the covering protective epithelium, so the dentogingival junction is composed of the attachment of the fibrous tissue and of the epithelium. There is a division of labor between these two types of attachments. The firmness of the dentogingival junction is due mainly to the fibrous attachment by the gingival fibers anchored in the cementum and fanning out into the gingiva, reinforced by fibers of the gingiva itself, some of which have a circular course around the tooth near the gingival margin. The biologic protection of this weak point is the function of the epithelial attachment. The epithelium attaches in a broad band. Although it is true that the attachment of the epithelium to the tooth is more firm than the cohesion of the epithelial cells, the firmness of the attachment of gingiva to the tooth is not the function of the epithelium but is the function of the fibrous tissue bound to the cementum of the tooth.

It now seems impossible that the original union between ameloblast and the forming and maturing enamel rods could survive the final calcification of the enamel matrix. One now is inclined to subscribe to Weski's idea; namely, that the epithelium, after enamel maturation, produces a cementing substance that attaches the epithelium

to the enamel surface and later to the surface of the cementum. If this concept is correct, Gottlieb's secondary enamel cuticle or dental cuticle is the medium of a secondary attachment of the epithelium to the tooth surface, replacing the primary union between the developing enamel and its epithelium. The epithelium, growing apically along the surface of the root, attaches itself to the cemental surface where a primary connection between epithelium and tooth surface never had existed. One of the important consequences of this new concept is the possibility—even the probability—of a reattachment of the epithelium to the tooth surface. If it is true that the enamel epithelium, after the dissolution of the primary union with the enamel, attaches itself secondarily by producing a cementing substance (the secondary cuticle), then possibly the epithelium reattaches to the enamel surface after it has been detached during dental therapeutic procedures. It is even possible that the epithelium may attach itself to inert foreign material, such as to the posts used in implant dentures.

The alveolar group of the principal fibers of the periodontal membrane, arranged in strong bundles, represents the alveolodental or suspensory ligament of the tooth. Embedded with one end in the alveolar bone proper and with the other in the cementum, the single fibers of the bundles once were believed to extend uninterrupted through the entire width of the periodontal space. This concept is untenable.

In continually erupting teeth with a high rate of eruption, a continual rearrangement of the periodontal fibers must occur without at any time lowering the functional efficiency of the suspensory dental ligament. The site of this continual rearrangement of the periodontal ligaments is the intermediate plexus. The fibers arising in the bone and those inserted in the cementum are joined and interwoven in a broad zone of irregularly arranged argyrophil fibers, the intermediate plexus. In this zone occurs the production of new fibers and in addition the formation of new fiber connections.

A study of silver-impregnated sections through human teeth shows that no single principal fiber can be traced from bone to cementum. Instead, the fibers all seem to end or to begin somewhere in the middle zone of the periodontal membrane. The single fiber bundles consist of shorter fibers that seem to be "spliced" in their middle. The human periodontal ligaments consist of alveolar fibers, dental fibers and an intermediate plexus. The possibility of adjustment in this intermediate plexus permits a functional reorientation of the principal fibers and their lengthening or shortening by the activity of fibroblasts in this zone. These changes occur without total loss of old fibers and their replacement by new fibers that would involve intensive rebuilding of bone and cementum.

The continual apposition of cementum appears now in a changed light; it is correlated with the relatively short life span of the cementum which is, probably, the same as that of bone tissue. Whereas in bone tissue, overaging leads to resorption of old bone and its replacement by new bone, overaging of cementum leads to the apposition of a new layer of cementum on the old layers. Cementum apposition is dependent, however, on tooth movement which creates the necessary space for the apposition of new layers of cementum.

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Pathology

**Leukoplakia of the oral mucosa**

E. Fasske, W. Hahn, K. Morgenroth and H. Themann. *Mitt.Ges.Bek.Krebskrankh.* 2:1-68 Dec. 1958

Schwimmer (1877) created the term "leukoplakia buccalis." He was unable, however, to demonstrate a common etiology or a uniform morphology for the various types of oral leukoplakia (caused by alcohol, allergy, avitaminosis, electrogalvanic currents in the oral cavity, estrogenic hormones, folic acid, hypercholesteremia, tobacco, syphilis or trauma to the teeth).

In an attempt to obtain a nosologic differentiation of the varieties of leukoplakia of the oral mucosa, specimens taken from 103 patients with leukoplakia of the cheeks, gingivae and the tongue were examined clinically, histochemically, electronmicroscopically and biochemically at the Pathological Institute of the Municipal Hospitals of Essen, the Dental College of the University of Münster and the Electronmicroscopical Institute of the University of Münster, all in Germany.

For comparative studies, specimens taken from 40 patients with diagnosed oral carcinoma and from 442 patients with other pathologic alterations of the oral mucosa, were examined. All specimens were obtained from living patients immediately after surgical enucleation.

Among the leukoplakia patients there were 60 men and 43 women; the average age was 57 years in men and 55 years in women. Only 12 patients were younger than 40 years.

The white and thickened dry patches, characteristic of oral leukoplakia and tending toward subsequent malignant changes, occurred on the mucous membrane at the following sites: (1) the cheek in 37 patients; (2) the jaws in 32 patients; (3) the lips in 10 patients; (4) the tongue in 9 patients; (5) the alveolar process in 6 patients; (6) the soft palate in 6 patients, and (7) the hard palate in 3 patients.

The material was divided into the following four groups: (1) leukoplakia caused by an uncomplicated epithelial hyperplasia; (2) leukoplakia caused by surface keratosis, hyperkeratosis or parakeratosis; (3) leukoplakia caused by a combination of hyperplasia and keratosis, and (4) leukoplakia associated with atypical epithelial changes.

The clinical differentiation between these four groups was made by a combination of cytologic and stomatoscopic examinations. Cytologic studies revealed the presence of a surface cornification and an atypical epithelial change; stomatoscopic studies with Hinselmann's colposcope showed the difference between the healthy oral mucosa and the pathologically changed mucosa. The pathogenesis of leukoplakia was determined electronmicroscopically and histochemically by study of the structural changes within the epithelial cells during cornification and by establishing the presence of the polysaccharide glycogen and of an acid mucopolysaccharide in the involved mucosal tissues.

The following conclusions were reached:

1. In all instances of oral leukoplakia, the basal cells of the surface epithelium show a large number of mitochondria and a lamellar structure but few tonofibrils within the cytoplasms (Fig. 1).

2. During cornification an increase in the number of tonofibrils takes place simultaneously with a decrease in the number of mitochondria (Fig. 2).

3. The basal cells decompose the glycogen under an aerobic condition but the epithelial cells contain glycogen deposits which subsequently are used as energy sources for differentiation processes.

4. During the cornification, keratohyaline is formed resembling the material of the stratum granulosum epidermis. At the same time the glycogen disappears and the stored saccharides are used up. This process is promoted by the adenosine triphosphate and phosphatase of the cell nuclei.

5. In most instances, oral leukoplakia seems to be caused by exogenic factors such as chronic mechanical traumas, ill-fitting dentures and smok-

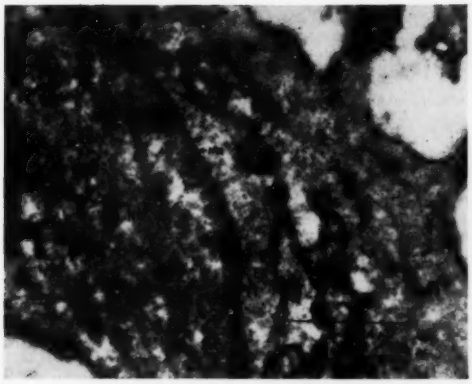

*Figure 1 Basal cells of the epithelium of a human oral mucosa under the electronmicroscope. TF = tonofibrils, M = mitochondria, ER = ergastoplasm, NU = nuclei, NM = nuclear membrane*

*Figure 2 Stratum spinosum of the epithelium of a healthy human oral mucosa under the electronmicroscope. E = epithelial cell, NU = nucleus, NO = nucleolus, TF = tonofibrils, Br = bridge corpuscle (desmosome)*

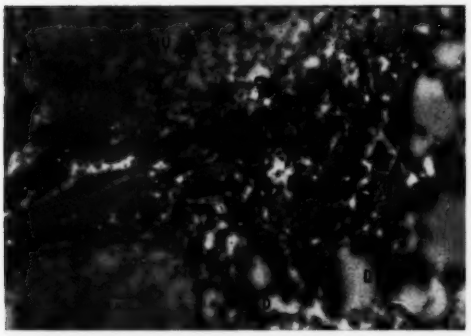

*Figure 3 Cornification of epithelial cells in leukoplakia of the oral mucosa under the electronmicroscope. NU = nucleus, TF = tonofibrils, KH = keratohyaline, D = desmosome. The tonofibrils gradually change into osmiophilic keratohyaline*

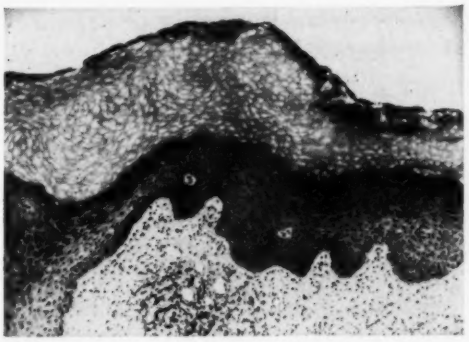

*Figure 4 Cornification in leukoplakia, Grade II. Acanthosis, hyperkeratosis and inflammatory infiltration of subepithelial corium*

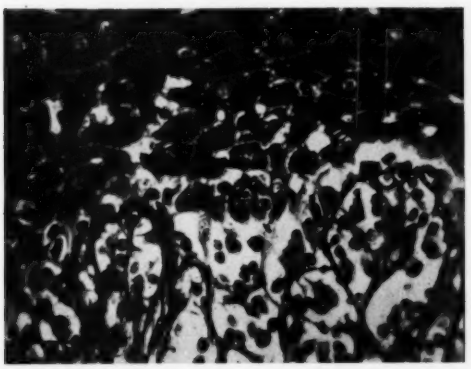

*Figure 5 Border between epithelium and connective tissue in leukoplakia of the oral mucosa associated with an unspecific chronic inflammation. Decomposition of the membranes of the basal cells. The sites of the inflammation in the intercellular system of the epithelium. Partial decomposition of fiber network*

ing, and by endogenic factors such as metabolic disturbances (diabetes mellitus).

6. In more than 50 per cent of the patients with oral leukoplakia, neither exogenic nor endogenic factors could be established with certainty. This "idiopathic" type of leukoplakia occurs mainly in senescent patients, almost as often in women as in men.

7. In about 10 per cent of the patients of Groups 1, 2 and 3, the leukoplakia subsequently changed to oral carcinoma. In Group 4, however, carcinoma at the same site as the leukoplakia developed in 34.5 per cent of the patients.

8. Because the malignant tumors, developed after leukoplakia, are difficult to approach surgically, the prognosis for enucleation is unfavorable. The survival rate is about 20 per cent.

9. The conscientious examination, diagnosis and treatment of patients with oral leukoplakia are of utmost importance for prevention and early recognition of malignant changes.

10. Leukoplakia of the oral mucosa must be considered as a precarcinomatous condition.

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### Pathogenesis and terminology of "erythematodes"

G. A. Rost. *München.med.Wschr.* 100:1021-1023 July 4, 1958

The so-called "lupus erythematosus" is an inflammatory dermatosis presenting various features. Two clinical types are differentiated, the acute or subacute disseminated form, and the fixed or discoid (chronic) form.

The etiology of the disease is unknown, although it has been suggested that streptococcal or tuberculous infections are the probable causative factors.

Tissue alterations are mainly confined to the corium in which the blood vessels are dilated with perivascular infiltration of round cells. The overlying epithelium becomes atrophic. Polymorphonucleated cells with rounded inclusion bodies develop in the blood.

The chronic discoid form is of special interest to dentistry, not only because the manifestations occur mainly on the face or on the lip, tongue and the oral mucosa but because this type occurs far more frequently than the acute form.

The oral lesions develop subsequent to the skin manifestations. Thickened reddish patches of indefinite form and size appear and often become ulcerated.

Endogenous and exogenous factors should be considered as having a possible influence on the development of the disease. Among the endogenous factors are several forms of infective allergy, especially after re-exposure to the allergen which produces auto-antibodies. Among the exogenous factors are irradiation with ultraviolet or roentgen rays, and mixed infections associated with catarrhal disorders of the respiratory tract. The similarity in clinical symptoms—acute coryza, slight rise in temperature, chill sensations and general indisposition—seems to support this hypothesis.

International dermatologists, pathologists, internists and dentists agree that the erroneous term "lupus erythematosus" should be abandoned, and replaced by "erythematodes discoides" for the chronic discoid form, and "erythematodes disseminatus" for the acute disseminated form. The traditional adjective "erythematosus" is rejected because it is etymologically incorrect.

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### The syndrome of mucosal atrophy

A. Vannotti. *CIBA Symp.* 6:134-141 Oct. 1958

Atrophy of the oral mucosa is frequently seen in dental practice. It is characterized by swelling, transparency, thickness and vascularity of the mucous membrane, and is often associated with surface desiccation resulting from decreased salivary secretion. The syndrome frequently is accompanied by a reduced resistance to bacterial invasion resulting in oral inflammation with or without chronic ulceration.

The decrease in salivary secretion leads to serious functional disorders such as dryness of the mouth (especially of the tongue), rhinitis sicca, atrophic tracheitis causing a dry irritating cough, atrophic esophagitis, hypoacidity, achlorhydria producing serious intestinal symptoms such as diarrhea, steatorrhea and chronic dyspepsia.

Generally, the manifestations of the syndrome

of mucosal atrophy are not serious but often cause various disagreeable and upsetting functional disturbances. Rhagades and aphthae occur followed by a decrease in the taste sensation.

Lesions of the oral mucosa may be accompanied by localized irritation of the facial skin producing insidious inflammatory reactions around the mouth, perlèche, and dermatitis of the nasolabial folds.

The reduced defense mechanism of the mucous membrane involved in the pathologic atrophic changes promotes inflammation of the salivary and lacrimal glands, accentuating the dryness of the mouth and the decreased lacrimal and salivary secretion, frequently resulting in chronic glandular enlargement and atrophy.

The symptoms are somewhat similar to those of Sjögren's syndrome and Plummer-Vinson syndrome. Similar clinical symptoms also are found in sprue, senile or malignant cachexia, malnutrition, avitaminosis, pellagra and pernicious anemia.

The possible causes of atrophy of the oral mucosa are numerous. Some of the most common factors are: (1) senile involution; (2) primary chronic inflammation in the oral cavity; (3) malnutrition; (4) inadequate nutritional assimilation; (5) prolonged antibiotic therapy; (6) toxicity causing hepatic dysfunction; (7) pernicious anemia and (8) hypoferric anemia and other iron deficiencies.

Clinical observations have suggested the possibility of an alteration in the cellular enzymic function in which the vitamin B complex and iron play an important part.

In order to examine the enzymatic activity in human disease, the blood titers of the metabolites derived from degradation of carbohydrates after an intravenous fructose injection (pyruvic acid, lactic acid, citric acid and alpha-ketoglutaric acid) were measured.

The investigation demonstrated serious disorders in the degradation of carbohydrates, pyruvic acid, lactic acid and alpha-ketoglutaric acid. The study, however, should be supplemented by further clinical and experimental investigations in the fields of dentistry and medicine into the disorders of the enzymatic function.

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## Pathogenesis, diagnosis and treatment of cervicofacial actinomycosis

J. Stadnicki, J. Krajnik and Z. Baraňzak.
*Postepy Stomat.* 3:80-85 March 1958

According to most textbooks, actinomycosis, especially the cervicofacial type, seldom occurs in man.

Within the last four years, however, 69 patients with cervicofacial actinomycosis, caused by *Actinomyces israeli* and transmitted from animals (mainly cattle, horses and pigs) were observed and treated at the Dental Clinic of the University of Poznaň, Poland.

The typical lesions were granulomas in which suppuration had occurred. Microscopic examinations showed that the center of the granulomatous growth was occupied by leukocytes and liquor puris and colonies of *A.israeli*. Surrounding these colonies were lymphocytes, plasma cells, macrophages and multinuclear giant cells.

Primarily, the jaws and gingiva were affected, and secondarily, various parts of the cervicofacial region. Osseous tissue, however, was involved in only 5 per cent of the 69 patients.

Treatment consisted of thorough drainage of the abscesses and the administration of appropriate antibiotics. *A. israeli* proved to be sensitive to most of the antibiotic agents employed.

Clinical experience with cervicofacial actinomycosis led to the following conclusions:

1. Neither serologic tests nor cutaneous reactions aid in the early diagnosis.

2. The best treatment results are obtainable if comparatively high doses of penicillin or streptomycin are injected intramuscularly.

3. Aureomycin hydrochloride, chloramphenicol, para-aminosalicylic acid (PAS) and iso-nicotinyl hydrazide (INH), orally administered, were less effective than penicillin or streptomycin.

4. In children, however, iso-nicotinyl hydrazide obtained excellent results.

5. Additional high doses of vitamins and proteins promoted quicker cures.

6. Roentgenotherapy proved to be ineffective and unnecessary.

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## Histology

### A diamond saw apparatus for cutting hard tissues

Erna Hammarlund-Essler and Gunnar Bergman. *Trans.Royal Schools Den.* 2:4:1-5 1958

The usual methods of producing ground sections of tooth structures involve cutting the specimen into slabs, which then must be ground thinner and polished before they are ready for microscopic examination. Various types of saws have been designed to simplify the cutting operation, but as none of them was considered wholly satisfactory, an attempt was made at the Royal School of Dentistry, Stockholm, to design a sawing apparatus that would meet the following requirements: (1) a simple and stable design; (2) a rapid and reliable manipulation; (3) a large cutting area; (4) an easily interchanged cutting wheel; (5) a tray for catching sections; (6) a possibility of dry cutting or cutting with the use of liquids such as water, alcohol or oil as coolants and lubricants; (7) a minimum scatter of dust and spray; (8) a micrometer adjustment to regulate thickness of slabs, and (9) a rotatable specimen holder, to enable the direction of the initial cut to be chosen after mounting.

Most of the components of the completed apparatus are enclosed in an iron stand. In the foot is an electric motor. The shaft is prolonged in a vertical direction, and the power is transmitted by a rim drive in the upper part of the stand to a precision shaft that turns on slip bearings. The shaft runs at between 5,000 and 6,000 rpm, depending on the cutting load.

The cutting wheel which is mounted on the lower part of the shaft is made on the same principle as the diamond wheel for dental use. It consists of thin stainless steel, the edge of which is covered with diamond powder. The standard disk used is 0.5 mm. thick and 7.5 cm. in diameter. The wheel, which rotates in the horizontal plane, is stabilized by two triangular metal plates whose pressure on the disk can be adjusted. In these stabilizing plates are recesses for the specimen. The stabilizers are designed for the standard wheel, but if they are removed, saws up to 10 cm. in diameter may be used.

Prior to the cutting operation, the specimen is attached by Kerr compound or an adhesive to a specimen holder. The holder is screwed to the horizontal part of the prolonged micrometer spindle. By means of a small lever, the specimen may be brought up to the wheel manually, or this also may be effected by means of a weight loading system.

Several holders are available for specimens of various sizes, and the holders are easily interchangeable on the cutting apparatus; moreover, they may be replaced accurately in their original position.

The standard cutting operation is performed with water as both coolant and lubricant.

The apparatus may be used to cut slabs 100 microns thick in series. If no study of very fine details of the hard tissues is intended, the slabs can be mounted directly on a glass slide and examined under the microscope. It is necessary in most instances, however, to finish the slabs by grinding and polishing as described by Hammarlund-Essler in 1955. Specimens which are not embedded, or those embedded in paraffin or plastic, are cut with or without coolant and lubricant; most specimens can be cut through in 30 seconds. The apparatus is simple to handle.

*Royal School of Dentistry, Stockholm, Sweden*

### Oxytalan fiber: a previously undescribed connective tissue fiber

H. M. Fullmer and R. D. Lillie. *J.histochem.cytochem.* 6:425-430 Nov. 1958

Analysis of complete autopsy findings in carcasses of rats, mice and guinea pigs, and analysis of selected human tissues obtained from autopsy and surgical specimens revealed the presence of a separate connective tissue fiber, termed "oxytalan" fiber. This fiber, distinct from the collagenous, elastic and reticular fibers, was found only in the periodontal membrane, tendons, ligaments,

adventitia of blood vessels, connective tissue sheaths surrounding skin appendages, epineurium and perineurium. Oxytalan fibers were not found in other connective tissues such as normal or aging dermis, granulation tissue and parenchymatous organ stroma. The distribution of oxytalan fibers appeared to be restricted to sites where the connective tissues have been subjected to extreme stress.

Staining tests showed that after peracetic acid oxidation, the oxytalan fibers stain with aldehyde fuchsin, orcein and resorcin fuchsin; they fail to react to orcein-new fuchsin and Verhoeff's staining. The stainable substance in oxytalan fibers is slowly eliminated by lysozyme and hyaluronidase after peracetic acid oxidation, and is believed to be a mucopolysaccharide. Similar effects were not observed when elastic fibers were stained.

Elastase did not catalyze oxytalan fibers fixed in Formalin, except after peracetic acid oxidation. A protease contaminant in elastase was observed.

The existence of oxytalan fibers, predominantly found in the periodontal membranes of rodents and man, has not been described in the literature previous to this investigation.

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### Neonatal influence on tooth structures

M. Bouyssou, H. Bouissou and S. Teulie.
*Cah.odontostomat.,Marseille* 8:15-53
July-Sept. 1958

The deciduous teeth regularly show an accentuated incremental ring at the level of enamel and dentin which had been formed and calcified at the time of birth. The presence of such a ring can be demonstrated in almost all deciduous teeth providing the specimens are carefully prepared in sagittal sections. These neonatal rings are more readily apparent in enamel than in dentin. They appear dark and hypocalcified in enamel and light in dentin. These rings probably represent lines of arrested growth and not lines of disturbed calcification.

Hypoplastic defects in neonatal rings seldom occur. About 78 per cent of the hypoplastic defects reported in literature have their inception at birth and continue through the period of infancy. About 3 per cent of these defects are acute and are confined to the neonatal period. They are seldom observed in dental practice because the lesions are small and, especially in deciduous incisors, are hidden behind the gingiva.

Pathologic accentuation of neonatal rings depends on postnatal adjustments; it may appear in the form of larger circles or deviations in the path of cellular activity. Hypoplastic defects occur as a result of the trauma of birth. Birth injuries, especially in premature infants, frequently produce hypoplastic defects of neonatal rings. A specific greenish discoloration of the rings occur in deciduous teeth of children with a history of neonatal jaundice (icterus neonatorum).

Hereditary anomalies in the dentin structure were observed in several children. The teeth, both deciduous and permanent, showed a specific bluish-brown discoloration. These defects were supposed to be in the enamel, but microscopic examination of the deciduous teeth and macroscopic examination of the permanent teeth revealed that the enamel remained normal in structure. Roentgenographic examination of all teeth showed an apparently complete obliteration of pulp chamber and root canals. Only minute parts of the pulp remained and the tubular arrangement of the dentin had disappeared. The dentin matrix had increased and showed peculiar staining reactions. The family history indicated identical genetic conditions in several family members.

Hypoplasia of the teeth can be regarded as one of the principal factors in predisposition to caries, and therefore the incidence of hypoplasia and the nature of its cause should be considered in studies of caries etiology. Although the incidence of hypoplasia of the teeth is comparatively low and in no way compares with that of caries, from the evidence of the findings it appears evident that a relationship exists between defects caused by neonatal influences on tooth structures and the susceptibility to caries.

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Biochemistry

## Bone formation and cartilage calcification in the maxillofacial region

Erik Henrichsen. *Acta orthop.Scandinavica* 27:173-191 March 1958

Histochemical studies of the formation of osseous tissue and the calcification of cartilaginous tissue in the maxillofacial region were carried out at the Biological Institute of the Carlsberg Foundation in Copenhagen, Denmark.

The alkaline phosphatase which appears in the cartilage cells during hypertrophy was found to be related to the degree of cell degeneration.

Calcification of cartilaginous tissue generally occurred when the cartilage cells containing phosphatase were decomposed. Cartilage cells, even if they contained alkaline phosphatase, did not always calcify.

The relations existing between cell degeneration, alkaline phosphatase activity, cell death and calcification of cartilaginous tissue appear to be similar to the relations between tissue cultures of fibroblasts and tuberculous lymph nodes.

The amount of alkaline phosphatase in the osteoblasts appears to be related to the degree of cell differentiation.

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## Contributions to the biochemistry of dental lymph

Th. Spreter von Kreudenstein. *New York State D.J.* 24:343-347 Oct. 1958

Bodecker, von Beust, Fish and others, on the basis of repeated histologic observations, directed attention to the existence of a liquid which occurs in the dental tubules and which was first mentioned by Kölliker (1854). Bodecker and Fish concluded that the enamel must be in communication with the living dental pulp by means of a lymph flow through the dental tubules. Thus, it was assumed that the liquid designated as "dental lymph" would have a nutritive function and would exhibit a streaming in the system of dental tubules. However, the concept concerning the existence of a lymph in the dental tubules has been criticized even in recent times by various authors, since no sort of experimentally established data have been submitted on the qualitative and quantitative composition of that liquid.

After the experiment of Nelsen, Wolcott and Paffenbarger (1952), the starting point for all subsequent research was the discovery that the dentin of freshly extracted teeth contained a fluid which could be forced out of the dental tubules by the application of heat, and which could thus be visibly and convincingly demonstrated.

By means of a diamond abrasive disk, the crown of a human molar is cut off close above the pulp cavity and the removed portion of the crown is warmed in a suitable apparatus, with the surface covered with enamel uppermost. The external temperature is increased from 22° C. to 90° C. within 100 seconds; this produces inside the dentin a rise in temperature up to 53° C. An exudation of numerous minute droplets is observed on the dry ground surface of the dentin. The droplets lie close beside one another, then immediately coalesce into larger drops, and finally form pools of liquid adherent to the surface.

The use of the elution procedure (von Kreudenstein and Stüben, 1956) is far simpler and much more suited for exact quantitative analysis. It has been shown that the dentinal fluid contains high concentrations of sodium and potassium. The dentinal fluid, because of its smaller protein content, cannot be equated with blood plasma. Rather it is a special, transparent fluid that is in direct contact with the crystallites. Its composition approaches that of the interstitial fluid, although it differs from the latter, as the dentinal fluid seems separated from the interstitial fluid by a barrier for sugar.

It has been possible to show that the glucose level in the dentinal fluid after the intravenous injection of glucose is subject to a characteristic rise and fall which follow the blood sugar curve. Extensive studies carried out in humans and in animals have shown that pharmacological agents,

such as sulfonamides and antibiotics, enter the dentinal fluid from the blood and that their level in the dentinal fluid in all instances bears a strict relation to their level in the blood. These results, which can be reproduced at any time, contribute to an understanding of the conditions of influx and efflux in the dentinal fluid space; also, they have some practical significance, inasmuch as enteral or parenteral administration of therapeutic compounds may bring about antimicrobial action within the dentin.

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### The influence of the refinement of carbohydrates on their cariogenicity: in vitro experiments on white and brown flour

G. Neil Jenkins, Margaret G. Forster, R. L. Speirs and I. Kleinberg. *Brit.D.J.* 106:195-208 March 17, 1959

Experiments were carried out to investigate quantitatively the statement of Osborn and others (1937) that cooked brown flour contains a substance or substances which reduce the solubility of teeth during incubation with saliva. Generally, their conclusions were confirmed. The amount of calcium dissolving in the presence of brown flour is only about two-thirds of that dissolving in the presence of white flour, when ground dental tissues or calcium phosphate are incubated in mixtures of flour and saliva.

The action of brown flour in lowering the solubility of calcium phosphate was produced neither by influencing salivary acid production or pH changes, nor by buffering mechanisms, nor by the release of calcium and phosphate ions.

When groups of whole teeth with waxed roots were incubated with saliva and either of the two flours, no differences between the amounts of enamel dissolving were consistently observed either by chemical analysis of the saliva or by visual inspection of the teeth. When part of the outer enamel was ground away, groups of teeth incubated with brown flour showed visually less evidence of decalcification in the ground areas of the enamel, but differences in the amount of calcium and phosphate dissolved were not detectable chemically.

The active substance(s) can be extracted with water from brown flour or brown bread; such extracts lower the solubility of whole teeth as well as of powdered materials.

The statement of Osborn and others that certain organic phosphates lower the solubility of calcium phosphate and teeth has been confirmed. The effect of brown flour may be accounted for at least in part by the phytate and other organic phosphates which they contain.

One exposure of teeth to an acidified phytate solution reduces their solubility during many subsequent exposures to acid.

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### Human parotid gland secretion: flow rate and interrelationships of pH and inorganic components

Howard H. Chauncey, Vincent F. Lisanti and Richard A. Winer. *Proc.Soc.Exper.Biol.& Med.* 97:539-542 March 1958

The effect of various stimuli—paraffin, lemon Life Savers, and flavored chicle—on the secretory rate of the parotid glands in 50 subjects and the interrelationships between rate of secretion and salivary composition are reported.

Analysis of the flow rate and composition indicated a significant positive correlation between the flow rate and the pH, sodium, calcium and bicarbonate contents. The potassium titer was related inversely to the flow rate. Only chloride and phosphorus levels showed no significant correlation with flow rate. Intercorrelations between the various salivary constituents were noted. No differences were found in the composition of saliva samples collected in the fasting and postprandial states. The composition of the parotid secretion varied not only from person to person but between the two glands in the same person.

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## Endodontics

### Current progress in endodontic practice

L. I. Grossman. *Internat.D.J.* 9:20-29
March 1959

In recent years much progress has been made in endodontic technics.

The pulpotomy operation has been in use for more than three decades. Nearly all authorities agree that calcium hydroxide is the preferred agent to use in contact with the amputated pulp, but it is not certain what factor stimulates the bridging of dentin.

If the root canal did not become infected, there would be no root canal problem. Apparently, it is not so much the type of microorganism present but the ability or failure of the body to ward off the microorganisms that decides whether an acute alveolar abscess will develop.

A root canal has a rough, irregular surface on which organic debris and microorganisms may persist once the canal becomes infected. The removal of these irregularities automatically eliminates myriads of organisms and dead tissue, and paves the way for sterilization of the canal. Root canal instruments must be confined to the root canal. There is need for improvement in the successive sizes of reamers and files, both as to gradation of diameter and individual tolerances.

The most important phase of root canal treatment is biomechanical preparation. More material can be removed from a root canal if it is moist or is bathed with a fluid during biomechanical instrumentation than if it is dry. Sodium hypochlorite has been found useful for this purpose, because it also is a solvent of pulp tissue and organic debris.

Instrumentation of narrow or blocked root canals may be facilitated by the use of ethlyenediaminetetraacetic acid (Östby, 1957).

The root canal should be irrigated alternately with two solutions: 3 per cent hydrogen peroxide and 5 per cent sodium hypochlorite. The interaction of these two solutions yields nascent oxygen which produces an effervescence that helps to wash the debris from the canal.

If an antibiotic is needed, as in the treatment of an acute alveolar abscess, the practitioner has a choice between phenoxymethyl penicillin, 125 to 250 mg. every six hours, or a broad-spectrum antibiotic; of the latter, the author prefers a combination of oleandomycin phosphate and tetracycline hydrochloride (Signemycin V, 250 mg. every six hours). There is no reason for giving an injection of penicillin, because the aforementioned antibiotics, in tablet or capsule form, are just as effective as the injection form.

Most endodontists in the United States now use cultures for bacteriologic controls.

The phase of endodontic practice in which there is most room for improvement is the filling of root canals. Of the many materials used, only gutta-percha and silver cones have attained favor. The next advance in endodontic practice will be the improvement of root canal filling materials. Epoxy resins appear promising.

An improved root canal cement consists of:

*Powder*
Zinc oxide 40 parts
Stabellite resin 30 parts
Bismuth subcarbonate 15 parts
Barium sulfate 15 parts
*Liquid*
Eugenol 5 parts
Oil of sweet almond 1 part

This cement is more adhesive and harder than the silver root canal cement and will not stain tooth structure.

Although silver cones are generally satisfactory, their chief disadvantage is that the butt end of the cone often must be cut off before cementing the cone. This means loss of the incisal or occlusal guide to indicate whether the cone fits the apical portion of the root accurately. Gutta-percha cones could be improved by being machined to conform to the sizes and taper of root canal instruments, and by being made stiffer so that they do not become deformed under pressure.

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Prosthetic dentistry

## Meatus obturator in particular and pharyngeal impressions in general

John J. Sharry. *J.Pros.Den.* 8:893-896 Sept.-Oct. 1958

The fixed and the hinged obturators are the best known appliances for cleft palate speech correction. Schalit (1946) first described in the American literature an entirely different type of obturator, the meatus obturator, for which he claimed better results. Even though he was essentially correct, Schalit's work received little notice. In 1954 the author published a preliminary report on the use of the meatus obturator. Since that time, it has been used many times at the cleft palate center of the University of Alabama School of Dentistry.

The meatus obturator does not depend on palatal muscle movement for its effectiveness, as do the other types of obturators. The meatus obturator is formed on the presumption that complete occlusion of the oropharynx from the nasopharynx is not necessary for good speech by persons with cleft palate. Rather, it is believed that partial occlusion of the nasal cavity will result in a pronounced diminution or complete elimination of the nasality that is objectionable in the speech of these patients. The results from a properly constructed meatus obturator are remarkable, and the construction is less complicated than that for the usual types of obturators. The details of construction were outlined by the author in 1954.

Whenever it can be used, the meatus obturator is the appliance of choice, with one important limitation: if the two sides of the cleft are very firm or the cleft is very narrow, it will not be possible to place sufficient bulk of modeling compound above these palatal remnants. These are the gates through which the modeling compound must pass to fill the meatal passage. The relative positions of the obturating mass in the fixed and the meatus obturator are shown in the illustration.

The results of the use of the meatus obturator are so encouraging that at the aforementioned cleft palate center it has been used as often as possible. In those patients where it is not practical to use a meatus obturator, the level of the fixed obturator has been raised as high as feasible, with better results.

Any attempts to obtain accurate detail in impressions by means of the "wash" materials may be abandoned as superfluous. A certain amount of leakage will occur around any obturator, and this leakage does not affect the efficiency of the appliance. It has been interesting to note again and again the secondary role that surgical and prosthetic procedures play in the correction of cleft palate speech. The nontraditional thinking behind the meatus obturator is the type of technical approach necessary to cleft palate treatment.

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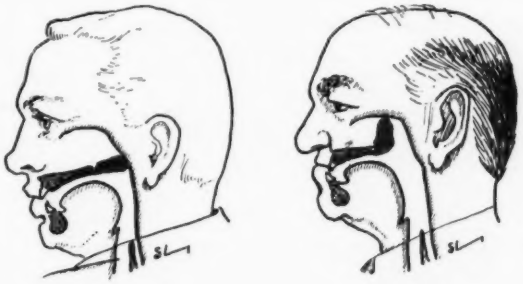

*The location of the fixed obturator (left) and the meatus obturator (right) in the mouth*

### Factors which influence the retention or extraction of isolated teeth

Harold E. Clough and Keith E. Thayer. *Iowa D.J.* 44:313-314 Dec. 1958

One of the foremost problems with partial dentures concerns the decision as to which teeth should be extracted and which retained. It is often a fallacy to assume that all sound, healthy teeth should be retained. The removal of a sound tooth or teeth may permit the construction of a prosthesis superior to one built around the tooth in question.

Often the dentist is confronted with a situation in which the mandibular first bicuspids are missing, the second bicuspid isolated and the molars missing on one or both sides of the arch. If isolated bicuspids do not have maximum bone support, and if the shape of the remaining anterior teeth is favorable for retention and support, often it is advisable to extract the isolated second bicuspids. This helps to solve the problem of balancing the occlusion, a problem which frequently arises because of slight extrusion or poor alignment of the isolated teeth. Extraction of such isolated teeth also avoids the use of a stress-breaker. When a unilateral isolated second bicuspid is the only remaining posterior tooth in the lower arch, stress and torque are transmitted to this isolated tooth, resulting in its early loss. This loss necessitates a repair or a remake of the partial denture, with additional expense and loss of time to the patient.

In the lower jaw, a unilateral isolated second or third molar may have to be retained if the residual ridges are unfavorable for a partial denture. Poor bone support, V-shaped ridges, excessive soft tissue and poorly contoured cuspids are factors which would make it inadvisable to extract such a molar.

The isolated bicuspid or molar may have to be extracted if it is malposed or extruded, if the bone support for the tooth is poor, or if the isolated tooth would cause severe rotational action and torque.

Contraindications for extraction include: isolated tooth or teeth well positioned and well supported; ridges unfavorable for support and retention; instances when stress-breakers can be used; instances when fixed bridges are used to splint isolated teeth, and instances when multiple clasping can be used.

Often the final decision concerning the isolated tooth or teeth depends on several of the listed indications and contraindications. Hasty decisions may cause the dentist and the patient many years of unnecessary worry and discomfort.

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### Recording the centric relation in complete dentures

G. Hanson. *Svensk tandläk.Tskr.* 50:627-641 Nov. 1957

An experiment was conducted to test the reproducibility of the Hanau wax rim method for recording centric relation. Two examiners made four independent registrations on each of eight edentulous patients with favorable mouth conditions.

Two types of recording bases and biterims were used. The standard type was made of shellac baseplates with biterims in tenax wax. A special kind of recording base was made of self-curing material. Biterims for the upper jaw were made of S.S. White's Biwax plus paraffin. Biterims for the lower jaw were made in compound. Only one upper and one lower model were used for each patient. After centric relation had been recorded, the two models were mounted in a measuring apparatus to determine the mutual relations of the models in three dimensions.

The vertical dimension and the anteroposterior deviation of the lower jaw in relation to the upper jaw were measured. The variation in inclination between two planes related to the upper and lower models was calculated. Error of measurement was computed from double determinations.

The results are presented in six tables. Any difference in accuracy in relation to the type of base used is of no significance. Error of measurement, however, seems to be an important factor. A statistically proved reduced vertical dimension and a more anterior position of the lower jaw were observed with the special recording base, depending on the technic used. Significant variations in the anteroposterior relation are consider-

able and a severe handicap in this method. The graphic is believed to give a more reliable result.

The uncertainty pertaining to the recording of centric relation, observed during this investigation, is no greater than is attained in general dental practice. The clinical use of the method is based on the possibility of checking the centric relation when inserting upper and lower set-ups in the mouth.

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### Affections of the temporomandibular joint: prosthetic procedures

Juan E. Valenzuela Alarcón.
*Rev.odont.Concepción* 5:6-22 Jan.-Feb. 1958

The temporomandibular joint and occlusion are so closely related that every change in contact between upper and lower teeth may produce disturbances in the temporomandibular joint such as clicking, with or without pain, unilateral or bilateral dislocation, Costen's syndrome, trauma to the meniscus, or deformity of the condyles.

Bruxism and bruxomania interfere with the proper functioning of the temporomandibular articulation and produce pathologic changes in the structures of the joint, the occlusion and the tone of the masticatory muscles.

A study of nine patients with various forms of traumatic occlusion which produced disturbances of the temporomandibular joint revealed the importance of early diagnosis in instances of malocclusion so as to provide immediate orthodontic treatment and prevent serious sequelae.

Lost teeth should be replaced without delay, and the construction of partial or complete dentures should always be preceded by the study of the occlusion so that any condition which interferes with occlusal harmony can be corrected. Dentures must never interfere with the physiological rest position of the mandible. Fixed bridges should be designed with special attention to the occlusion, to prevent pathologic changes which affect the joint.

In the case reported, the patient, a 36 year old man, had malocclusion (Angle's Class II, Division 2) associated with a pronounced overbite. The gingivae were ulcerated because they were constantly subjected to irritation from the upper anterior teeth. The bony tissue was severely affected.

The patient received a removable partial upper denture which opened the bite by 3 mm. With this denture, which was worn day and night, the malocclusion was gradually corrected and total regeneration of the gingivae was obtained.

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### The overlay full denture

Wilmer Eames. *J.Colorado D.A.* 37:6-8 Dec. 1958

A 37 year old woman had an extreme prognathism and 7 mm. of overclosure; that is, from rest position, the patient had to close 7 mm. to occlude. The overclosure aggravated the prognathism. The mandible was nearly normal in size, but the maxillary arch was underdeveloped. The maxillary teeth were sound, having had good care.

No teeth were extracted. A complete upper denture was made to cover all the teeth, the ridges and entire palate. The patient has worn this denture for nearly a year with complete comfort and an improvement in appearance and chewing ability. The key to the success of this appliance was the 7 mm. of space, which allowed room for setting the teeth into good occlusion. Both the posterior and anterior teeth in the complete denture were set vestibularly to the natural maxillary teeth.

The lingual surfaces of the artificial teeth had to be relieved in several areas so that they could fit closely to the natural teeth. In effect, the artificial teeth functioned as a veneer.

After a few days of feeling a "fullness" in the lip region, the patient accepted the denture completely. She has no noticeable phonetic disability and speaks without difficulty. The improvement in facial contour is pronounced.

The patient is aware of the need for extraordinary home care to guard against the danger of rampant caries. No carious breakdown has occurred. The unusual lateral stability of the denture, caused by presence of the natural teeth, has impressed the patient with the desirability of retaining her natural teeth, and this understanding keeps the patient diligent in her home care.

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Operative dentistry

## Amalgam vibrator

Gunnar Bergendal. *Svensk tandläk.Tskr.* 52:109-119 March 1959

The author has constructed an instrument for condensing amalgam in prepared cavities. The vibrator (Fig. 1) looks like an ordinary contra-angle. The head can be rotated and fixed in different positions. Working instruments (Fig. 2) are kept in place by means of a slide catch (a in Fig 1). The working instruments are of two types: (1) cylindrical, no. 1 to 5 and bulb-shaped no. 31 for filling Class I and Class II cavities (the instruments mainly are perpendicular to the occlusal surface of the tooth), and (2) heart-shaped or bean-shaped, no. 11 to 15 and spatula no. 21 for filling Class III and Class V cavities (these instruments are perpendicular to the longitudinal axis of the tooth).

The working principle of the instrument is illustrated in Figure 3. The rotating eccentric center (c) in the head meets every axial pressure (A) against the instrument with a series of counterblows having a frequency and stroke corresponding to the rpm of the engine and the pressure exerted on the instrument. Radial pressure (R in Fig. 3, right) on the instrument is met by a similar series of lateral counterblows.

The amalgam should be thoroughly condensed outside the mouth. The greatest possible amount of mercury is pressed out of the portion of amalgam with the aid of parallel pliers having plain ground jaws. Insertion of the amalgam in the cavity and vibration thereafter must be done in rapid succession. The condensed portion of amalgam is inserted in the cavity with a gun type amalgam carrier. The cavity should be half filled in one operation (Fig. 4, left). With the cylindrical instrument no. 2, the dry amalgam is made soft (Fig. 4, right) and can now easily be worked into any crevice of the cavity, using high speed and a light touch. In the next stage the cavity is quickly and heavily overfilled with amalgam, after which final condensation is begun.

The amalgam is covered with a 0.10 mm. celluloid strip (Fig. 5), and final condensation is achieved with the largest cylindrical instrument no. 5 being used on top of the strip. The instrument is moved with a circular motion over the surface of the celluloid strip, using a lower speed and a higher pressure. In teeth with high cusps, the final condensation is obtained by using the bulb-shaped instrument no. 31. To condense the amalgam in a Class V cavity, an appropriate instrument is chosen from among no. 11 to 15. The selected instrument should cover the whole cavity opening and correspond to the curvature of the tooth. The cavity is filled to excess and the vibration and final condensation are done in one continuous operation. In Class III cavities, it may be


*Figure 1 Amalgam vibrator. Working instruments are kept in position by means of a slide catch (a)*

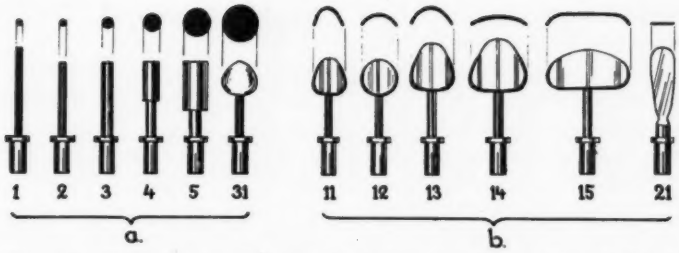



*Figure 2 There are two main types of working instruments: (1) cylindrical, no. 1 to 5 and bulb-shaped no. 31 for filling Class I and Class II cavities, and (2) heart-shaped or bean-shaped no. 11 to 15 and spatula no. 21 for filling Class III and Class V cavities*

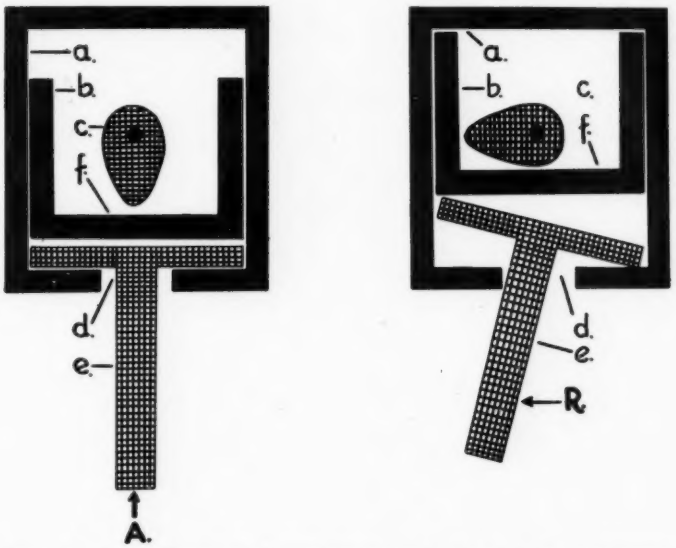



*Figure 3 Demonstration of the working principle. Left: The rotating eccentric head (c) meets every axial pressure (A) against the working instrument (e) with a series of counterblows. Right: Radial pressure (R) on the instrument (e) is met with a similar series of lateral counterblows*

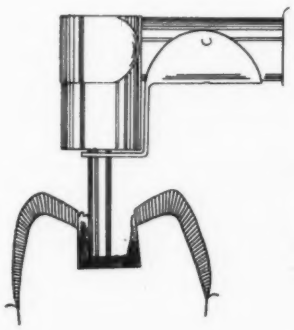
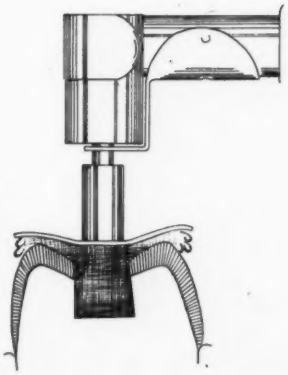


*Figure 4 Left: With the cylindrical instrument no. 2, the dry amalgam is made soft and worked into any crevice of the cavity. Right: The amalgam is covered with a strip of celluloid and final condensation is achieved with the no. 5 cylindrical instrument used on top of the strip*



necessary to separate the teeth in advance. A celluloid strip is inserted between the teeth, the cavity is filled to excess, the strip is stretched over the amalgam and vibrated with the spatula no. 21 applied on top of the strip. The excess mercury will flow over the cavity edge between the tooth and the strip and will be removed when the strip is removed.

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### Proportioning of dental amalgam

Gunnar Ryge, C. W. Fairhurst and R. E. Oberbreckling. *J.A.D.A.* 57:496-506 Oct. 1958

Twenty-five commercially available alloy and mercury dispensers, 11 of which were twin-type dispensers (mercury and alloy dispensers in one unit), were examined to establish the accuracy of dispensation of alloy and mercury. The dispensers in most instances were used as received from the supply house. A standard procedure was established for the use of the dispensers. The manufacturer's directions were followed, except that twin-type dispensers were used with only one of the chambers filled at a time to control the dispensation of each material separately. Also, the effect of using the dispensers full, half full and one-sixth full was studied. The following conclusions were reached:

1. Commercially available alloy and mercury dispensers display great differences in the degree of accuracy which may be expected.

2. Dispensation by weight is less accurate than dispensation by certain volumetric dispensers.

3. Most dispensers are not set very accurately when received from the supply house.

4. A considerable difference in alloy-mercury ratio may result from the use of most dispensers.

5. The best accuracy was obtained using predispensed alloy together with a good mercury dispenser.

6. Accurate proportioning is of significance for the strength and dimensional behavior of amalgam.

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### Hypersensitive dentin

*J.A.M.A.* 169:1813 April 11, 1959

*Q.*—About a year ago, information was obtained for the treatment of hypersensitive dentin. This included use of ammoniated silver nitrate, followed by 1 drop of eugenol, and brushing the teeth with hot mineral oil, Andresen's paste, sodium silicofluoride, or Thermodent tooth paste. A sodium fluoride-kaolin-glycerin mixture and stannous fluoride were not recommended because they might cause degeneration of the dental pulp. Is any other treatment recommended?

*A.*—All methods named have their proponents, but controlled clinical studies to support them are generally lacking. The sodium fluoride-kaolin-glycerin mixture has been tested and shown to be an effective desensitizer. It can be used safely because damage to the pulp results only when sodium fluoride is used in freshly cut cavities. Stannous fluoride and silver nitrate may stain teeth, but are perfectly safe. Desensitizing agents will not prevent the recurrence of sensitivity if erosion is continuing and exposing fresh, sensitive dentin. Treatment should include correction of the factors causing erosion or gingival caries. Andresen's paste, which is a mixture of phosphates and other salts, for daily application, is supposed to correct the factors causing erosion or gingival caries, but the evidence is unconvincing.

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### The setting of zinc oxide-eugenol mixtures

D. C. Smith. *Brit.D.J.* 105:313-321 Nov. 4, 1958

The mixture of zinc oxide and eugenol finds universal application in dentistry as a cavity lining, pulp capping, and temporary filling material, but the precise nature of the setting reaction was, until recently, uncertain. A satisfactory explanation of the setting reaction has been provided by Copeland and others (1955), who showed that formation of zinc eugenate and sorption of eugenol occurred. Similar conclusions were reached in the course of the present work, part of a study of impression pastes.

1. The setting of zinc oxide-eugenol mixtures is due to both physical and chemical causes, that

is, to a concurrent sorption of eugenol and formation of zinc eugenate through chemical reaction. The balance between these physical and chemical factors is principally dependent on the nature of the oxide.

2. Eugenate formation is primarily responsible for hardening when zinc oxides manufactured from the metal are employed. Only a proportion of the oxide reacts; unreacting eugenol remains entrapped and weakens the mass. The differences between various oxides of this type are a function of the precise conditions of production, aging, moisture content and so forth.

3. The presence of moisture is essential for eugenate formation which is accelerated by most salts but especially by zinc salts. The present results suggest that this is due probably to an increased rate of hydrous oxide formation together with catalysis due to the hydrated zinc ion and related species.

4. Sorption of eugenol is predominant when oxides obtained by thermal dissociation of zinc salts such as zinc carbonate are used. These oxides are fine grained and possess considerable lattice strain. When the oxides are heated to higher temperatures, crystal growth and strain relief occur and hardening becomes more dependent on eugenate formation. The superior strength and hardness of the set mass obtained when these oxides are used probably are due to absorption of eugenol by zinc oxide.

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### Compression tests of certain filling materials in the laboratory

Raul Acuña Ortiz. *Rev.dent.Chile* 48:149-153 July-Aug. 1958

The resistance to compression of various materials used for fillings was tested at the School of Engineering of the University of Chile. The Riehle Universal machine which was used in determining the breaking point of the materials—that is, their maximum resistance to compression—has a compressive force of 25 metric tons. The materials tested were zinc oxyphosphate cement (Lee Smith Co.); zinc oxyphosphate cement, 2 parts, with an antibiotic, 1 part; red copper cement (Lee Smith Co.); silicate cement (S. S. White Dental Mfg. Co.); Delva Gold silver amalgam (Farmodental Ltda.); XX Century silver amalgam (L. D. Caulk Co.); copper amalgam (L. D. Caulk Co.); cast monetary gold and cast pure gold.

One of the most striking observations in the tests was the fact that the addition of an antibiotic to ordinary cement in the proportion of 1 part of antibiotic to 2 parts of cement increased the resistance of the cement to compression. Of all the dental cements tested, silicate cement exhibited the greatest resistance to compression; nevertheless, its fragility when exposed to repeated shocks or to the impact of chewing makes it necessary to restrict its use to Black's Class III and V cavities. Neither monetary gold nor pure gold suffers fracture, but as they become flattened in resisting compression, they bend sideways, that is, they bulge outwards.

The resistance of copper amalgam to compression is only about one fourth that of silver amalgam, and this is an additional reason for avoiding its use on the occlusal surfaces of the posterior teeth, which are particularly subjected to powerful compressive stresses. A direct relation exists between hardness and resistance to compression which provides information in regard to the mechanical resistance of the filling materials tested.

Dentists should pay particular attention to the specifications for dental materials published by the American Dental Association because they contain the indices of the mechanical behavior of the various materials under the different complex stresses which are exerted by strong masticatory force that is estimated to range from 80 to 120 kg.

*Molina 51, Santiago, Chile*

Anesthesia and analgesia

### Local allergic edema induced by injected procaine

Sheppard Siegal. *J.Allergy* 29:329-335 July 1958

Allergy to procaine hydrochloride is uncommon; its most frequent manifestation is contact dermatitis, an occupational disease of dentists.

Three cases involving dental patients are reported in which there was repeated reaction to procaine, characterized by severe swelling of the cheek and face at the site of injection for local anesthesia.

A 42 year old woman had pronounced edema of the face which had appeared two to four hours after minor dental work done under procaine anesthesia. The swelling occurred on two occasions, lasting six to eight days each time and accompanied by noticeable itching. There was no evidence of any generalized reaction to the injection. Three years earlier she had noticed a slight, similar reaction to a local anesthetic. She gave a history of a brief period of urticaria many years before, proneness to wheezing after colds, and some intolerance to milk. The family history was positive for allergy.

A 26 year old woman was seen with a history of pronounced swelling over the jaw, which had occurred on three occasions after minor dental procedures under procaine anesthesia. On the third occasion, almost the entire left side of the face had been affected, with partial closure of the eye due to edema of the eyelid. Twice the reaction had lasted for five days, and on the third occasion the edema did not subside until two weeks had passed. There was no itching, but some local pain was present, aggravated by chewing and eating. There was no indication of any generalized reaction. Two years earlier she had had persistent generalized pruritus without eruption for several weeks.

A 23 year old woman reported that three times in recent months swelling of the cheek developed on the side of minor dental work done under procaine anesthesia. This began 12 to 14 hours after treatment and lasted 36 to 48 hours. There was neither pain nor itching, and no sign of general reaction. She had received injections of procaine many times previously, without ill effect. The family history was negative for allergy.

In each of these three patients intracutaneous tests were carried out with 2 per cent procaine hydrochloride in aqueous solution. In each patient, the immediate reaction was negative, but in each the reaction to the delayed test done with 0.1 ml. of procaine was positive at 24 hours. Positive reactions after 24 hours also were induced by the intracutaneous injection of butethamine hydrochloride.

The results of skin tests with lidocaine hydrochloride were negative, and each patient was found able to tolerate lidocaine anesthesia for subsequent dental procedures.

Twenty-five men and women in a control group were tested intracutaneously for the immediate reaction to 2 per cent procaine in aqueous solution; 65 men and women were tested with 0.1 ml. of procaine for the 24 hour test. All responses were negative.

*Lenox Hill Hospital, New York, N.Y.*

### Ether analgesia

*Lancet* No. 7074:669 March 28, 1959

Interest is growing in the use of general analgesia for minor and major surgery, including dental operations. A new apparatus designed by Nandrup (1958) allows the administration of accurately measured low (0.1 to 7 per cent) concentrations of ether (or other volatile anesthetics, such as trichloroethylene and vinyl ether) carried in air. The nonrebreathing technic for which his apparatus is intended has several advantages:

1. The concentration of the inhalation anesthetic that reaches the patient can be known accurately (especially useful when ether is used for analgesia, since the limits of satisfactory concentration are narrow).

2. The patient's ventilation can be measured by the flow rate of gases.

3. The technic eliminates the difficulties arising from the need to absorb carbon dioxide.

The machine contains an electromagnetic compressor which pumps air along two pathways. One stream passes through a needle valve and flow meter; the other, via another needle valve, into a vaporizer where it becomes saturated with ether vapor. The air-ether mixture then is passed through another flow meter calibrated to express the rate of flow in terms of pure anesthetic vapor. The compressor draws a variable proportion of its air through the outer jacket of the vaporizer, thus enabling the temperature of the ether to be kept constant at 20°C.

An advantage of the apparatus is its easy portability, since no gas cylinders are required. The Nandrup apparatus has been used to produce analgesia for 600 major and minor operations. The concentration of ether required usually was not above 1.5 per cent; this means that the oxygen content of the inspired gas mixture falls only 0.3 per cent, a negligible amount. This concentration of ether is nonexplosive.

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### A safe, effective local anesthetic in dentistry

S. William Simon, Alfred B. Beard and Dayton W. Willoughby.
*Mil.Med.* 123:377-380 Nov. 1958

A double blind study was made to evaluate the effectiveness and safety of tripelennamine (Pyribenzamine), an antihistamine, as a local anesthetic agent. Tripelennamine is a white crystalline powder which is stable, nonhydroscopic and readily soluble in water. The pH of aqueous solutions varies between 6.56 (10 per cent solution) and 6.71 (2.5 per cent solution). The molecular weight is 291.2. Solutions are stable indefinitely at room temperature and can be resterilized by heating without loss of potency.

Ninety patients, ranging in age from 25 to 72 years, were included in the study. The solutions investigated were: 1 per cent aqueous tripelennamine without epinephrine; 2 per cent aqueous tripelennamine without epinephrine, and 2 per cent procaine hydrochloride with epinephrine. The ampules were marked "A," "B," and "C," and the contents were revealed to the investigators only at the conclusion of the investigation. Patients received nerve block anesthesia, infiltration anesthesia, or a combination of nerve block and infiltration anesthesia. The number of patients in each group was small.

Satisfactory block anesthesia was obtained with 2 per cent tripelennamine and 2 per cent procaine with epinephrine. Block anesthesia was slightly less effective with 1 per cent tripelennamine. In infiltration anesthesia the 2 per cent procaine with epinephrine was superior to 1 per cent tripelennamine, which in turn was superior to 2 per cent tripelennamine; the same conclusions were noted in those patients receiving a combination of block and infiltration anesthesia. A great amount of blood was present in the operating field when 1 per cent or 2 per cent tripelennamine was used. No adverse reactions were noted during or after the operations.

Another series of patients was selected, and 2 per cent procaine without epinephrine, and 1 per cent tripelennamine with epinephrine, were used. The 2 per cent procaine solution without epinephrine was about as effective as the 1 per cent solution of tripelennamine without epinephrine, and the former resulted in a bloody operative field.

When 1 per cent tripelennamine with epinephrine 1:50,000 was used, the results were excellent in infiltration anesthesia and the operative field was as dry as when the 2 per cent procaine with epinephrine was used. Each patient receiving a nerve block with 1 per cent tripelennamine with epinephrine had good anesthesia. Induction time, length and adequacy of anesthesia were about the same as with 2 per cent procaine with epinephrine, and no side reactions were noted.

One per cent tripelennamine with 1:50,000 epinephrine is an effective local anesthetic which may be used in block, infiltration or a combination of block and infiltration anesthesia, and may be expected to give as good results as 2 per cent procaine with epinephrine. In drug sensitive and allergic patients tripelennamine would be much safer.

It is hoped that others will repeat and enlarge on this work. The authors intend to continue this project with a larger series of patients.

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### The significance of liver dysfunction in mouth cancer

Norman Trieger, Grantley W. Taylor and David Weisberger. *Surg.Gynec.& Obst.* 108:230-234 Feb. 1959

Of the records of 152 patients with a diagnosis of epidermoid carcinoma of the palate, tonsillar fossa or floor of the mouth, seen during the years 1946 to 1957 at the Tumor Clinic of the Massachusetts General Hospital, the records of 68 patients were sufficiently complete to supply adequate data to analyze probable predisposing factors.

Of 68 patients with oral cancer, 66 (97 per cent) smoked 20 or more cigarettes a day, or the equivalent in other forms of tobacco. Only two patients were nonsmokers.

Of the 68 patients, 51 (75 per cent) were habitual or excessive users of alcohol.

Six patients (9 per cent) gave a history of syphilis and had positive serologic tests.

Oral irritation plays an important role in mouth cancer. Fifty-four per cent of the 68 patients showed signs of chronic oral irritation. Of 21 patients with carcinoma of the floor of the mouth, 13 (62 per cent) showed evidence of chronic irritation. Of 43 patients with cancer of the tonsillar fossa, 20 (46 per cent) showed evidence of chronic trauma. Carcinoma of the hard palate was not observed in patients who wore artificial dentures, suggesting that the prostheses protect the hard palate from carcinogenic tars.

Forty (59 per cent) of the 68 patients had unequivocal evidence of hepatic cirrhosis. Six additional patients had histories of chronic cholecystitis, jaundice after exposure to hepatotoxins, or severe nutritional deficiencies.

One or more of these predisposing or precipitating factors were operative in all but 2 of the 68 patients, and multiple factors were present in 59 (87 per cent) of the patients. Of the group with multiple factors, 97 per cent smoked to excess and 75 per cent used alcohol to excess.

Of the total group of 152 patients, the ratio of men to women was 7.5:1.

Forty patients identified as having had hepatic cirrhosis at the time of diagnosis of their oral carcinoma averaged 57 years of age. In those patients without demonstrable cirrhosis, oral carcinoma developed at the age of 70.2 years. Thus, in patients with hepatic cirrhosis, oral cancer developed 13 years earlier, on the average, than in those without hepatic disease.

The five year survival rate for patients with oral carcinoma and concomitant cirrhosis was 19 per cent. The five year survival rate for patients without hepatic cirrhosis was 40.3 per cent. Thus, prolonged survival favored the noncirrhotic group notwithstanding the more advanced age of these patients at the onset of cancer.

Among the 68 patients with malignant tumors of the mouth, 12 additional primary epithelial cancers occurred in 10 patients.

These data foster the concept of cocarcinogenesis, a conditioned substrate on which factors such as chronic irritation and tobacco may act. These data further suggest that, even in the presence of a conditioned mucosal substrate with superimposed carcinogens and irritants, the process of development of oral carcinoma is slow and may take up to 20 years or more.

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### Tumor clinic conference

*Cancer Bul.* 11:30-31 March-April 1959

A 66 year old man was admitted to the hospital on referral by his physician. About three months previously he had had a lower left third molar extracted. The socket failed to heal and the patient continued to have pain in this region for three months. Three weeks before admission to the hospital, the patient consulted a dentist who advised him to seek medical attention. Diagnosis of epidermoid carcinoma Grade II was made from biopsy of the lower left gingiva.

The patient was treated with external roentgenotherapy, 4,000 r, over a period of three and a half weeks, with subsequent implantation of 12 low intensity radium needles which were left in

place for four days. The entire tumor dose from the combined procedures was estimated to be from 7,000 to 8,000 r. Tumor regression and softening of infiltration in the tongue and faucial pillar were noted, and the patient was discharged from the hospital.

He was readmitted five months later because of intense local pain and difficulty in opening his mouth. He was treated with power sprays and packing in the ulcerated region, and some improvement was noted. About two weeks after readmission the lower left jaw was partially resected. Examination of the tissue showed a squamous carcinoma Grade II.

The patient's recovery was satisfactory, but two months later evidence of recurrent tumor at the edge of the excision was noted. A combined radical neck dissection and resection of the mandible was performed. Although the resection was performed in a heavily irradiated region, the patient's recovery was uneventful.

Further follow-up examinations during the next six years showed no evidence of recurrence. The patient was free of disease, weighed about 200 pounds, and maintained his own tin and sheet metal shop, although he was 69 years old.

This case report illustrates the complementary use of radiation and surgical therapy for patients with cancer of the head and neck.

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### Melanoma of the hard palate

G. S. Hoggins and K. R. Thornton.
*Proc.Roy.Soc.Med.* 51:696-697 Sept. 1958

The diagnosis of malignant melanoma has been facilitated by Allen's description (1949) of a large series of proved cases and by his formulation of pathological criteria to aid the diagnosis. Particular emphasis is laid on an appearance in the lower layers of the epithelium of the affected region, which Allen refers to as "junctional change." This change is almost invariably found in premalignant and malignant melanoma. Together with a malignant cytology and invasion of the dermis, it is essential to a diagnosis of malignant melanoma.

The characteristic changes were observed in a 48 year old man, first seen in May 1955, who complained of irritation in the front of the palate which had increased recently and had caused some swelling which interfered with the wearing of his maxillary denture. A round, purplish, vascular area about 2 cm. in diameter was seen in the anterior part of the hard palate left of the midline. It was firm, with no surrounding induration, and was only slightly tender to touch. An inflamed area of the mucosa was situated more labially and in the midline. One well-defined lymph gland was palpable beneath the angle of the lower jaw on the left side.

Roentgenographic examination revealed what appeared to be two distinct lesions, one in the region of the anterior palatine foramen and the second to the left of the first.

The purplish lesion was radically excised. Histologic examination showed the tumor to be malignant melanoma. After the operation, the gland in the left side of the neck gradually increased in size. Consultation ruled out further surgery or the use of roentgenotherapy.

The patient remained well for a year with no recurrence at the site of the primary lesion, but in July 1956 proptosis of the right eye developed and was attributed to an intraorbital secondary deposit of the tumor. The patient died in December 1956, 21 months after the onset of symptoms.

The histological criteria of malignancy formulated by Allen for the skin also applied to the palate. These criteria are: pseudoepitheliomatous hyperplasia and junctional change in the epithelium, malignant cytology and invasion of the epithelium and corium by malignant cells. The prognosis of mucosal tumors is uniformly bad.

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## Periodontics

### The effects of stress on the periodontium of the Syrian hamster

Peter F. Fedi, Jr. *J.Periodont.* 29:292-300 Oct. 1958

A study was undertaken to determine the effect of stress on the periodontium of the Syrian hamster. This was a pilot study for future work on stress as related to periodontal disease.

Of 24 Syrian hamsters, 6 were used as controls and 18 were subjected to nonspecific adverse influences for six weeks. Each experimental animal underwent three types of stress: (1) exposure to cold; (2) exposure to a water bath and violent exercise, and (3) subcutaneous injections of 10 per cent Formalin.

The 18 hamsters subjected to experimental stressors exhibited a nonspecific stress reaction. When viewed microscopically, the principal fibers of the periodontal membrane appeared to be coarser than in the control sections; there was less regularity in arrangement of the principal fibers of the periodontal membrane; in some regions of the experimental sections the fibroblasts appeared to be more mature and irregular in shape; new bone formation in some regions seemed to be irregular and the bone could be described as heteromorphic, and the osteoblasts appeared to be somewhat rounded, to have more pyknotic nuclei and to be less regular in arrangement.

These findings indicate that the alveolar bone and periodontal membrane of Syrian hamsters are affected by nonspecific stress factors.

The following observations were contrary to those of other investigators: there was no apparent decrease in the number of osteoblasts, no apparent increase in the number of osteoclasts, no significant decrease in the number of collagen fibers and no apparent decrease in the number of cementoblasts. It may be possible that the reason for the differences in observations is that in this experiment the Syrian hamster was used, whereas the other investigators experimented with the rat.

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### Dental tartar

*Brit.M.J.* No. 5120:522 Feb. 21, 1959

*Q.*—Is there any diet or drug treatment to reduce salivary acidity leading to the production of an excessive amount of calculus? Is excessive calculus injurious to the teeth?

*A.*—There is little evidence to support the view that the formation of an excessive amount of calculus is associated with acidity of the saliva. The current view is that the formation of calculus is essentially a bacterial process in which colonies of microorganisms and debris provide the matrix for a deposit of calcium salts from the saliva. Factors predisposing to deposition include a viscid saliva, lack of friction (as when a tooth is unopposed), irregularity of teeth, or roughness of surface. Little is known about the constitutional factors that also may be involved.

Prevention depends, therefore, largely on good oral hygiene. Although diet and drug treatment prescribed to alter the pH of the saliva are unlikely to be successful, the patient's oral hygiene may be improved if he finishes a meal with fibrous food, such as celery or an apple. Considerable damage to the supporting structures of the teeth results if calculus is not removed regularly. Calculus prevents the natural stimulation of the gingival margin by the friction of food, and the gingiva becomes inflamed by the products of the microorganisms which grow and multiply under

the calculus. The result is a chronic inflammatory condition of the gingival margin which gradually spreads to the periodontal membrane and bone supporting the teeth. Periodontal disease is responsible for the loss of more teeth than is any other dental disease. However, it can be arrested if not too advanced, by scaling and careful attention to oral hygiene.

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### A periodontal survey

L. J. Coxhead. *New Zealand D.J.* 54:101-104 July 1959

One hundred and seventeen patients—mostly consecutive new patients—ranging in age from 15 to 74 years were examined for evidence of periodontal disease, oral hygiene, presence of calculus, pocket formation and mobility of teeth.

Eighty-eight per cent of the 117 patients had gingivitis in some form. Gingivitis was found most commonly on the lingual aspect of the lower posterior teeth, and next most commonly on the buccal aspect of the upper posterior teeth. The cause of gingivitis in the mouths examined appeared to be poor oral hygiene in 87 per cent, calculus in 63 per cent, faulty restorations in 5 per cent, partial dentures in 4 per cent, infections in 2 per cent, traumatic occlusion in 2 per cent, and food impaction in 2 per cent.

A disclosing fluid—a 2 per cent aqueous solution of merbromin—was painted on the labial and buccal surfaces of all teeth on the right side of each mouth examined. The patient then rinsed his mouth with water. Of the 117 patients so examined, 11 had no stain left on the teeth after rinsing, 83 had stains left about the gingival margins and interproximally, and 23 had heavily stained teeth.

Only 28 of the 117 patients could remember having been shown a method of toothbrushing. Only 40 patients were in the habit of visiting a dentist at least twice a year, and a further 20 patients once a year, and only a few patients could state that their dentist had taken an interest in their oral hygiene. Only 10 per cent of the patients brushed their teeth satisfactorily. It was concluded that the apparent high correlation between the incidence of poor oral hygiene and gingivitis was real, and was attributable largely to lack of instruction of patients by dentists.

The percentage of patients with calculus increased with age, from 50 per cent at age 15 to 19 years, to 82 per cent at 30 to 39 years, and 78 per cent at 40 years old and older.

Forty-two per cent of the 117 patients exhibited pocket formation about the teeth, the incidence increasing with age.

Sixty-two per cent of the 117 patients had lost one or both of the lower first permanent molars.

In New Zealand, periodontal disease is to be found in the mouths of a majority of patients seen in a general practice. Most patients are unaware of the presence of periodontal disease, and dentists seldom bother to treat it. The public cannot be expected to take an interest in the prevention and treatment of periodontal disease until the profession first has recognized and accepted its responsibility for dealing with the disease. Dental students must be taught that a survey of the mouth for periodontal disease is a normal part of every routine general examination.

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### A suggested classification of common periodontal disease

German A. Carranza and Fermin A. Carranza, Jr. *J.Periodont.* 30:140-147 April 1959

Etiologic factors of common periodontal disease may be classified as determining (inflammation and trauma) and predisposing (all the factors which alter the reparative power of bone and periodontal membrane). Determining factors are local in origin but their action can be aggravated by systemic factors. Predisposing factors are of systemic origin and they act by altering the normal metabolic interchanges of bone and periodontal membrane and the reparative capacity of the tissues. In addition to periodontal disease determined by inflammation and trauma, there is a third category which is a combination of the other two and shares in different degrees their characteristics; this category constitutes the combined periodontal syndrome.

If the traumatic influences are not extremely

**Proposed classification of common periodontal disease**

| Etiology | | Pathology (Microscopic picture) | Clinico-Radiographic Picture | Name Suggested | |
|---|---|---|---|---|---|
| *Determining factor* | *Reparative tissue reaction* | | | | |
| INFLAMMATION | Normal | Similar to the following but with slight or no deepening tendency. Normal reparative bone processes. | Gingival inflammatory changes. Relative pockets. Shallow true pockets. Slight horizontal bone loss. Very slow evolution. | INFLAMMATORY PERIODONTAL SYNDROME | SUPERFICIAL |
| | Poor | Inflammatory infiltrate. Epithelial proliferation. Accelerated apical migration of the epithelial attachment. Extension of inflammation to supporting tissues. Denudation, necrosis and breakdown of cemental pocket wall. Calculus. Osteoclastic resorption of alveolar crest. Marked tendency to horizontal bone loss. Suprabony pocket formation. | Gingival inflammatory changes. Bleeding, calculus, suppuration. Supraalveolar pockets. Horizontal bone loss with loss of lamina dura at the alveolar crest. Mobility: Late or absent. | | DEEP |
| TRAUMA | Normal | Thrombosis, necrosis of areas of periodontal membrane. Localized resorption of bone and cementum. Compensatory repair of resorbed areas. | Slight mobility to occlusal pressure. Sometimes thickening of the lamina dura and apical periodontal space. No pocket formation. | TRAUMATIC PERIODONTAL SYNDROME | COMPENSATED |
| | Poor | Osteoporosis of the lamina dura. Widening of the periodontal space. Disorganization of periodontal fibers. Reduction in height of alveolar bone with marked tendency to vertical bone loss. Slight or no compensatory repair of resorbed areas. | Mobility. Eventually migrations and diastemas. Widening of the periodontal space. Localized or generalized loss of lamina dura. Vertical bone loss. No pocket formation. | | UNCOMPENSATED |
| COMBINATION | Normal | Compensated traumatic lesions + superficial inflammatory lesions. | Inflammatory gingival picture + compensated traumatic picture. Shallow pockets. | COMBINED PERIODONTAL SYNDROME | COMPENSATED |
| | Poor | Uncompensated traumatic lesions + deep inflammatory lesions, frequently intraalveolar pockets. | Uncompensated traumatic picture + deep and uneven pockets, frequently intraalveolar. Marked mobility. | | UNCOMPENSATED |

severe and the periodontal structures are reasonably strong, the lesions can be repaired; they are compensated traumatic lesions. When the reparative capacity of bone is insufficient to compensate the destruction produced by traumatic forces, uncompensated traumatic lesions begin to appear.

A proposed classification of common periodontal diseases is presented (see table), and the role of the different local and systemic factors is discussed.

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Pedodontics

## Time of eruption of permanent teeth in the children of Czechoslovakia

V. Ponková and J. Hájek. *Českoslov.stomat.* 59:104-113 Feb. 1959

The chronologic age of Czechoslovakian children at the time of eruption of the permanent teeth was determined.

By a representative sampling method, 16,000 children were selected from the entire territory of the country. The children, from 9 to 16 years old, consisted of the following nationalities: Czech (67.55 per cent), Slovakian (24.45 per cent), German (3.5 per cent), Ukrainian (1.9 per cent), Hungarian (1.5 per cent), Polish (0.7 per cent), Jewish (0.13 per cent), and indeterminable ancestry (0.97 per cent). This ratio corresponds approximately with the distribution of nationalities in Czechoslovakia.

The children's chronologic age was recorded according to three criteria: (1) beginning of eruption of the permanent dentition; (2) duration of eruption, and (3) completion of eruption with exception of that of the third molars. When even a comparatively small part of the crown of a tooth became visible in the oral cavity, the tooth was considered as being erupted.

The average chronologic age of the Czechoslovakian children at the time of eruption of the permanent teeth was as follows:

1. In the upper jaw: (1) central incisors, 10 years; (2) lateral incisors, 11 years; (3) cuspids, between 13 and 15 years; (4) first bicuspids, between 12 and 13 years; (5) second bicuspids, between 12 and 14 years; (6) first molars, between 9 and 10 years, and (7) second molars, between 14 and 16 years.

2. In the lower jaw: (1) central incisors, 9 years; (2) lateral incisors, 10 years; (3) cuspids, between 12 and 14 years; (4) first bicuspids, between 13 and 14 years; (5) second bicuspids, between 13 and 14 years; (6) first molars, between 9 and 10 years, and (7) second molars, between 14 and 15 years.

There were no statistically significant differences between nationalities. The permanent teeth in girls erupted about three months earlier than in boys. Premature loss of deciduous teeth did not influence greatly the development and eruption of permanent teeth. The difference in eruption time between the left and right teeth in both jaws was negligible.

By comparison with the data reported by Röse (1909), it became evident that the eruption of the permanent teeth in the present generation of Czechoslovakian children begins and ends about 18 months earlier than 49 years ago.

Based on the results of the investigation, systematic dental care of the children in Czechoslovakia has been extended and now includes children five years old registering for admittance in the elementary schools.

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## Characteristics of the occlusion in the deciduous dentition

Louis J. Baume. *Tschr.tandheelk.* 65:797-812 Dec. 1958

Diagnosis and treatment planning of malocclusion in the deciduous dentition should be based on the following criteria which were established by serial observations made at the Institute of Dental Medicine of the University of Geneva, Switzerland:

1. In the arrangement of deciduous teeth in both dental arches, two normal patterns should be distinguished: (1) the spaced type, characterized by large diastemas between the anterior teeth in the upper dental arch, and smaller diastemas between the posterior teeth in the lower dental arch; this type may be termed "ape diastemas" because it represents the most consistent primitive pattern, and (2) the closed type, characterized by a narrow dental arch width, representing the prognostically less favorable pattern of modern man. These two normal patterns remained unchanged during the evolutionary development of man, as proved by the constancy of the dimensions of the

dental arches in children from the age of three and a half years until the permanent teeth erupt.

2. The tooth germs of the permanent incisors, revealed by horizontal roentgenograms, are accommodated in an echelon position. Any rotation or lingual displacement of the individual tooth germs of the permanent incisors may cause severe tooth crowding after eruption.

3. The normal incisal relationship in the deciduous dentition is characterized by a slight overbite and overjet which gradually develops to an edge-to-edge bite because of attrition. The type of the individual deciduous incisor bite and the extent of the forward growth of the lower jaw are the factors which determine the degree of the incisor bite in the permanent dentition. The increase in tooth height, however, has little bearing on the type of incisal relationship.

4. The occlusal relationship of the posterior region in the deciduous dentition is determined by the distal surfaces of the occluding second deciduous molars and the cuspid to cuspid relations.

The terminal pattern of the deciduous dentition shows two normal variables: (1) the distal surfaces of the second molars form a mesial step because of the approximately equal mesiodistal length of their crowns; this is the primitive pattern, and (2) the distal surfaces of the opposing second molars form a vertical line; this is the prevailing, progressive pattern requiring special mechanisms for proper interdigitation of the erupting molars.

Proper cuspid-to-cuspid relationship may be estimated by measuring the distance between the distal surfaces of the cuspids averaging 2.5 mm. ± 0.5 mm. A greater distance indicates the presence or development of mesialization; a smaller distance indicates distalization.

Distoclusion includes both a distal step and an end-to-end cuspid relationship (± 10 mm. distal surface distance of the occluding cuspids).

Mesioclusion comprises an extended cuspid-to-cuspid distance of over 2.0 mm., and an end-to-end bite (or negative overbite) of the incisors.

The cuspid-to-cuspid relationship remains constant during growth and development; and contention of some authors that a physiologic mesial shift of the lower jaw takes place during the growth period is not substantiated by facts.

Growth and development of the maxillofacial region involves histogenesis and histokinesis both effected by coordinated processes of the tissue formation and tissue resorption. The expected growth can be estimated only by tissue differentiating methods such as are used in histology and experimental biology. The expected development, however, can be estimated by measuring the manifestations of growth such as changes in dimension, shape and relationship.

Measuring methods including roentgenographic cephalometry are conducive to analysis of growth and development of the maxillofacial region; a complex of the development of occlusion is the main event.

The results of this study have been rechecked by more than 20 different and independent investigators.

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Orthodontics

## Growth of the main head dimensions from birth to twenty years of age in Czech children

Milan Dokládal. *Human Biology* 31:90-109 Feb. 1959

The postnatal growth and development of the human head progress most intensely during two periods: (1) from birth to seven years of age, and (2) from puberty to adulthood. The first phase is mainly a reflection of the rapid growth of the brain at that time. The period between the seventh year to puberty is one of relative stagnation. The acceleration during adolescence concerns mainly the circumference and the length of the head, and lasts until the middle teens are reached. After that time, subsequent growth of the head in all dimensions is minimal and does not exceed 2 per cent of the total size.

The dimensions (circumference, length and breadth) of the heads of 2,879 boys and 2,763 girls (from birth to adulthood) were measured at the department of anatomy, College of Medicine, Masaryk University, Brno, Czechoslovakia. All children were of Czech nationality, and for each sex and year, the average number of children measured was 100.

The data obtained indicated that from birth through the preschool years, children of the present Czech generation have somewhat larger heads than their predecessors of 30 to 60 years ago.

Even at birth, all head dimensions of boys exceed those of girls. The difference is statistically significant throughout growth.

Measurements of the head made in the United States differ considerably from those made in Czechoslovakia. The average length of the head at all ages in American white children is 10 mm. greater than in Czech children, but the breadth is from 5 to 7 mm. narrower (Meredith, 1953).

By comparing the values of head length and breadth in Czech children with the corresponding data published in other European countries, it was established that in head length, Czech children resemble German children from Dresden (Röse and Martin, 1928), and Polish children from Cracow (Jasicki, 1938) and from Poznan (Czaplewski, 1934). The breadth of the head in Czech children at all ages is the greatest observed in Europe, and it can be assumed that the Czechs have shorter but broader heads than all other nationalities. This can be explained by the accumulation of subcutaneous adipose tissue and by the increased bulk of the masticatory muscles.

The dimensions of the head in Czechs are comparatively stable and do not, as yet, exhibit any evolutionary changes which have occurred in the population of other countries.

The standard deviations and coefficients of variation in the recent study were comparatively low and do not differ greatly from the data recorded by other authors. The findings indicate that the series was sufficiently homogeneous and the data reasonably free from errors of observation and measurements.

Similar studies of the main head dimensions may be useful for orthodontic procedures based on cephalometric or teleroentgenographic findings showing disharmonies in the anteroposterior relation of the jaws and their relations to the analysis and treatment of malocclusion, as well as changes in the facial profile.

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## Heredity and the craniofacial complex

Bertram S. Kraus, William J. Wise and Richard H. Frei. *Am.J.Orthodont.* 45:172-217 March 1959

In a study of six sets of same-sex triplets, the hypothesis of genetic determination of the craniofacial complex was tested. The major problem was to determine which, if any, traits of the craniofacial complex as defined in lateral and frontal headfilm tracings are amenable to heritability estimations.

Various technics were used to establish zygos-

ity. The use of blood grouping, bicuspid traits, ridge counts and the presence or absence of a Carabelli cusp will together give highly reliable determinations of zygosity. Nevertheless, only dizygosity can be indicated with certainty; monozygosity can be indicated only with a greater or lesser degree of probability. The use of the combined technics affords the best probability estimate.

After zygosity was established in each of the six sets of triplets, the tracings of lateral and frontal headfilms were compared by a variety of methods to determine whether identical and dissimilar genetic constitutions in each set of triplets were reflected differentially in the craniofacial complex. There was no correlation between variability and zygosity; hence, the craniofacial complex was just that—a complex of so many interactions of discrete elements and forces that the role of heredity could not be discerned, much less estimated.

The craniofacial complex then was divided into its component parts—the cranial vault and the facial complex. By different methods of registry and superimposition, it was revealed that the cranial vault outline is a composite, consisting of the outline of the calvarium and the outline of the cranial base. When each aspect of the cranial complex was examined singly, neither showed a positive correlation with zygosity; hence, it was concluded that neither allows discrimination between predominance of heredity or of environment.

When the facial complex was broken down into two component quadrilaterals—the upper facial and the maxillomandibular—and studied, it was found that there was no greater similarity in lengths of lines or degrees of angles in monozygotic pairs taken from triplet sets than in dizygotic pairs.

The final part of the study consisted of defining aspects of individual bones, as observed in lateral and frontal headfilms, in terms of profile lines. Comparison was made by attempting to superimpose the single bone profile tracings of monozygotic and dizygotic pairs. Almost perfect concordance was the rule in monozygotic triplets, whereas only a low degree of concordance (below 50 per cent) was found in dizygotic triplets. Thus it was demonstrated that the simplest type of trait—morphologic aspects of single bones—is the best indicator of the control of hereditary factors in the craniofacial complex. Zygosity could be determined in this way with the same high degree of reliability exhibited by blood groups, bicuspid traits and ridge counts, taken singly or together.

It might be speculated that the morphology of all the bones of the craniofacial complex are under the rather rigid control of hereditary forces. Then how can the variability in craniofacial outline that is as apparent in monozygotic triplets as in dizygotic and trizygotic triplets be explained? It would seem that heredity governs morphology, but environment in its multitudinous facets has much to do with how these bony elements combine to achieve the harmonious or unharmonious head and face.

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## Oral surgery

### Experiences in the surgical management of tic douloureux

E. S. Gurdjian, J. E. Webster and D. W. Lindner. *Surgery* 45:264-273 Feb. 1959

In 25 years' experience in the surgical management of tic douloureux, 391 operations were performed on 348 patients. The patients ranged in age from 26 to 90 years; 80 per cent were over 50 years old and 43 per cent were over 60. The ratio of men to women was 6:7. Eighty-three per cent had symptoms for more than one year, and 40 per cent had symptoms for more than five years. Trigger mechanisms were recorded in two thirds of the patients. Bilateral trigeminal neuralgia was present in 15.

Decompression of the sensory root has been a satisfactory first step in the management of 83 per cent of the patients. With recurrence of pain, the root may be partially or completely sectioned as needed. Among very old patients, section of the sensory root may be a better initial procedure. Partial section should be preferred over complete section if section of the sensory root is decided on. If the patient has had alcohol injections with the last injection unsuccessful, section of the sensory root is preferred.

Of patients undergoing decompression of the sensory root, pain returned in 17 per cent, necessitating section of the sensory root.

Of 15 patients with bilateral tic douloureux, in 14 the condition was first present on one side and several years later it began on the opposite side. Patients on whom bilateral root section was performed were able to carry on postoperatively, although a certain degree of re-education before a mirror was necessary for them to manage their eating and drinking satisfactorily. It is important in these patients to save the motor root.

First division trigeminal neuralgia has been treated by avulsion of the supraorbital and supratrochlear nerves after a therapeutic test with local infiltration. Many patients improved with this procedure and remained well for from one to five years.

Numbness involving one or two of the divisions of the trigeminal nerve may be present after a decompression operation. Ulcerating sores of the face were noted in two patients; probably these patients rubbed the face and the sides of the nose almost constantly because of paresthesia in the zone of denervation. After external irritation of the region was controlled, under hospital supervision, the ulcers healed. Peripheral facial paralysis ordinarily is seen soon after the operation. Occasionally it may become manifest two to four weeks after surgery, particularly among patients undergoing the decompression procedure. In a few instances, the paralysis may last for a week or ten days; more frequently, it lasts for two to six months. The longer the paralysis lasts, the less likely is the normal return of function.

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### The mechanism of postparotidectomy gustatory sweating (the auriculotemporal syndrome)

D. H. Glaister, J. R. Hearnshaw, P. F. Heffron and A. W. Peck. *Brit.M.J.* No. 5102:942-946 Oct. 18, 1958

Gustatory sweating—that is, perspiration during mastication—may occur in the region of the distribution of the auriculotemporal nerve after parotidectomy, penetrating wounds of the parotid gland, or suppurative parotitis. Detailed studies were carried out on two patients with the syndrome, and in less detail on a further 14 postparotidectomy patients, eight of whom showed gustatory sweating.

Gustatory sweating was abolished by blocking the otic ganglion, but was unaffected by blocking the cervical sympathetic nerve. From this it was concluded that gustatory sweating was not mediated by the sympathetic pathway responsible for normal thermal sweating, but by the parasympathetic pathway responsible for normal gustatory salivation.

The theory which best explains the observed facts is that of aberrant regenerating parasym-

pathetic fibers reaching sympathetic end-organs (that is, sweat glands). The authors' demonstration of the converse phenomenon, thermal salivation, provides further evidence in favor of the theory of aberrant regeneration.

Hypersensitivity to acetylcholine of the partially denervated sweat glands of the auriculotemporal region is present, and its degree influences the severity of the syndrome.

The condition theoretically lends itself to treatment in a number of ways, but more work is required to find a satisfactory practical solution.

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### Congenital cleft lip and cleft palate: postoperative complications

F. Burian. *Acta chir.& traum.Čechoslov.* 24:417-423 Oct.-Dec. 1958

The incidence of congenital cleft lip and cleft palate in Czechoslovakia is steadily increasing.

The review of the case reports of the Clinic of Oral Surgery of the University of Prague revealed that in almost 30 per cent of infants and young children who were operated on for repair of these clefts, growth disorders affected the upper jaw and various facial deformities developed which sometimes became apparent in later years. The most serious postoperative complications occurred after surgical repair of complete bilateral cleft lip combined with cleft palate. It has been demonstrated that the main causes for these complications were as follows: (1) inadequate surgical methods; (2) extremely radical interventions, and (3) operations performed at too early an age.

The frequency and the degree of the postoperative complications, however, indicated that there were also additional causative factors. It can be assumed that in the majority of instances, the nature of the primary defect plays a significant part in the development of secondary defects. Lack of closure may have been associated with reduction and deficiency of the anterior part of the upper jaw or of the entire intermaxillary bone, probably occurring in the embryo at the end of the third week of gestation, thereby reducing the growth potential. No direct surgical intervention can correct these prenatal deficiencies; however, they may be limited in their manifestations by adequate orthodontic and prosthetic procedures.

In congenital cleft lip and cleft palate, the time and method of surgery contemplated should be determined by the specific characteristics of the defect. This determination should be based on the evaluation of the patient's general health condition and his functional difficulties.

The more severe the cleft and the more numerous the components leading to possible secondary defects, the more will it be necessary to postpone the operation. In most instances, interposition of mucosal flaps into the cleft and combining the cleft repair with pharyngoplasty will be indicated to create an artificial Passavant's cushion. Orthodontic treatment and speech therapy should follow the operation.

The important role that the parents' full cooperation plays in the postoperative care cannot be overemphasized. All preoperative and postoperative procedures, whether applied by the oral surgeon, pedodontist, orthodontist, prosthodontist, pediatrician or phoniatrician, must be coordinated.

In infants with cleft lip or cleft palate in whom the feeding problem is serious, an obturator should be inserted which remains in place until the surgical closure of the cleft is completed.

*Clinic of Oral Surgery, University of Prague, Czechoslovakia*

### Clefts of lip and palate: their treatment in Finland

K. K. Koivumaa. *Suomen hammaslääk.toim.* 54:141-160 June 1958

The treatment of cleft palate patients is centralized in Finland. All such patients are treated in the Hospital for Plastic Surgery of the Finnish Red Cross, in Helsinki.

Closure of the cleft lip is performed when the patient is 45 to 60 days old, and the palatal cleft is closed when he is 18 to 24 months. The theory is that the child will have a better chance to learn the proper articulation if he is treated before the age when he learns to speak. If secondary corrections are necessary, they are performed when the patient is between six and seven years old, before he enters school.

Functionally good or satisfactory results are obtained with the primary operation in 80 to 85 per cent of the patients. About 10 per cent of all patients require later treatment.

In the five year period from 1953 through 1957, 745 patients with cleft lip or cleft palate were treated; cleft lip was treated in 269 patients and cleft palate in 645 patients. Secondary corrections of the lip and nose were made in 139 patients, and secondary corrections of the palate in 50 patients. During this period, 1,103 operations were performed.

On the staff of the hospital is a dentist (a specialist in prosthetics) who provides the necessary obturators and profile-correcting prostheses to patients. Since 1957 an orthodontist has been available for consultation and treatment. A phoniatrician participates in the therapeutic consultations and is responsible for the speech therapy that follows the operative treatment.

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### Oral surgery during anticoagulant therapy

*J.A.M.A.* 168:2081 Dec. 13, 1958

*Q.*—Increasing numbers of patients are seen who are on long-term anticoagulant therapy and who require extraction of teeth or other oral surgical procedures. One approach to this problem has been to withdraw the anticoagulant about 48 to 72 hours preoperatively, perform the extractions and then reinstitute anticoagulant administration 24 or more hours later. Some insist on prothrombin time determinations for confirmation, and some recommend vitamin $K_1$. Still others feel that the danger of thrombosis far outweighs the problem of postextraction hemorrhage and prefer that anticoagulant therapy not be discontinued. This latter group holds that local bleeding from an extraction wound can be managed by local measures. Please give comments and suggestions.

*A.*—Patients on anticoagulant therapy will show a strong tendency toward prolonged hemorrhage. This risk always must be considered when oral surgery is contemplated. It is little appreciated that blood loss during some oral surgical procedures is comparable to that occurring in major surgical procedures. Experience at the New York Veterans Administration Hospital indicates that anticoagulant drugs be withheld before dental operations. Prompt resumption of therapy when hemostasis has been obtained will result in minimal interruption of anticoagulation therapy. The patient's oral surgeon and physician, or cardiologist, should determine after consultation the treatment plan for the individual patient relative to the cessation of anticoagulant therapy or vitamin K administration. The oral surgeon should not assume the responsibility for the discontinuance of anticoagulation therapy.

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### Organization of hospital dental services

Abraham Schmunis.
*Tribune odont.,Buenos Aires* 42:22-26
Jan.-Feb. 1958

The statistics covering dental care for children and adults in Buenos Aires reveal a great number of tooth extractions. Dental wards in the hospitals are few and poorly equipped; they cannot provide adequate dental care to the public.

Many dental departments are located in old hospitals. All municipal dental services were centralized some years ago under the Municipal Dental Institute which occupies an old, decrepit building. The dental equipment also is very poor. It is unbelievable that Buenos Aires, with its five million inhabitants, has few modern hospitals.

In the dental departments of most hospitals in the city, only exodontics is practiced. The few dentists available in the hospitals have practically no equipment to practice conservative dentistry.

Most of the children in Argentina cannot afford private dental service. Their parents are ignorant of or indifferent to dental care for their children. If proper dental service were provided, many oral and maxillofacial abnormalities could be avoided or prevented, with less trauma to the patient and less expense to the government than are being created by the present neglect. Al-

though the Obligatory Dental Assistance Law is on the books, financial means must be provided to implement this law.

What is needed is a complete plan of hospital reorganization, providing for the construction of adequate buildings, and adequate financing. During the transition period, a minimum program would contain the following items:

1. Present dental departments should be activated and made efficient, and dental service should be provided throughout the day.
2. Prosthodontic service should be provided, and more conservative treatments instituted.
3. A health insurance program should be set up, with dental service provided by private dentists in their own offices, under an agreement with the government Health Insurance Administration.
4. A dental health education plan should be launched, stressing the importance of oral hygiene and prophylaxis.

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### Dentistry in Veterans Administration hospitals

Joseph O. Mona and Charles M. Belting. *J.Oral Surg.* 16:294-299 July 1958

There are 173 Veterans Administration hospitals in the United States, ranging in size from 56 to 3,300 beds. Each VA hospital has a dental staff, ranging from one dentist supported by two auxiliary personnel to ten dentists supported by 19 auxiliary personnel. The VA has maintained a complete dental department in all its hospitals since 1921, and has gained a body of experience in the administration and operation of hospital dental service which may be helpful as a pattern for the development of similar services in other hospitals.

The chief of dental service is charged with the responsibility of planning, administering and directing the hospital dental program. The link between the dental phase of medical care and other aspects of medical care consists of a dental clinical record. The dental service commonly is divided into various sections, including oral diagnosis and treatment planning, restorative dentistry, periodontics, prosthodontics and oral surgery. The dental staff in a VA hospital has three main professional functions—diagnostic, therapeutic and educational.

The dental services in all VA hospitals conduct inservice training programs for their professional and auxiliary personnel. Twenty-four residencies in oral surgery, prosthodontics and periodontics, and 23 internships are now being conducted at 28 VA hospitals. These programs are approved by the Council on Dental Education of the American Dental Association and are encouraged at all hospitals having an association with medical and dental schools.

The percentage of hospitals in the United States reporting a dental department rose from 26 per cent in 1945 to 35.1 per cent in 1956; the 64.9 per cent of the nation's hospitals without a dental service comprise a fertile area for development and improvement of hospital dental care.

*Veterans Administration, Central Office, Washington, D.C.*

### Needs and values of a hospital dental service

John P. Looby. *J.Oral Surg.* 16:471-473 Nov. 1958

A diagnosis of the health status of a patient who seeks care in a hospital is not complete without an evaluation of the condition of the patient's mouth. For this, a dentist is required. Clinical manifestations of systemic disease may be present in the oral cavity; these alterations of the normal tissues may interfere with the patient's nutrition or may produce a source of infection.

The hospital that fails to make use of dentists is denying its patients a valuable service. The dentist in the hospital can help educate interns and nurses in principles of dental health.

Serious oral pathological conditions can be treated best in a hospital providing competent dental consultation and treatment. Traumatic problems involving the osseous structures of the oral cavity and associated regions can be treated best by a dentist. Tumors involving the oral cavity should be treated by the staff of the dental department or with them as part of the team. Congenital deformities of the mouth are the responsibility of the dental profession.

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Plantation

## Epithelial reactions to inserted subperiosteal implants

Ulrich Rheinwald. *A.E.O.S.I.* 2:181-190, 1959

Clinical experience with subperiosteal implant dentures which had been inserted in upper and lower jaws of edentulous patients at the dental clinic of the Katherinen Hospital in Stuttgart, Germany, proved that failures due to epithelial reactions may become evident after a period of three to five years.

A subperiosteal implant may function satisfactorily as the carrier of a complete denture for two to three years without producing significant reactions. Gradually, and sometimes suddenly, inflammatory changes in the mucous membranes and in the surrounding tissues occur. A series of follow-up examinations, therefore, are necessary to evaluate each subperiosteal implant denture. These follow-up examinations must extend over a period of at least five years.

To determine whether a subperiosteal implant denture can be called a success, the following factors must be taken into consideration: (1) the quality and the technic of the surgical intervention performed; (2) the quantity of the prosthetic load to be carried by the implant; (3) the properties of the metal used in construction of the implant, and (4) the type of pathologic changes caused by tissue reaction to the foreign body (implant).

Biologic response of osseous tissue to inserted implants gives the best clue for evaluation of the clinical result obtained. In many instances, the symptoms observed after more than two years resemble those of periodontosis. These symptoms may be called "pilastrosis" or "pilastritis," and should be treated as if they were periodontal conditions.

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## Complete and partial implant dentures

Siegbert Kämmer. *A.E.O.S.I.* 2:219-230, 1959

Eighteen complete implant dentures (5 in the upper and 13 in the lower jaw), and 33 partial implant dentures (22 in the upper and 11 in the lower jaw) were inserted during the last five years at the dental clinic of the University of Leipzig, Germany.

The subperiosteal implants carrying these dentures were made of cobalt-chromium-molybdenum alloys.

Follow-up examinations, extended over a period of one to five years, revealed that in instances in which the implant meshwork fitted too tightly, resorption of the osseous tissue occurred, especially under the abutments. To avoid such unfavorable tissue reaction and also to obtain a more favorable distribution of the masticatory stresses, larger meshwork substructures were used which were attached directly to the maxillary or mandibular bones.

Construction, surgical intervention and insertion were performed in two stages. In patients requiring partial dentures, these procedures were carried out on the same day.

To attach the implant firmly to the bone, the ivory splint method was used because ivory becomes absorbed within a comparatively short time and is replaced by renewed osseous tissue. A favorable attachment of the inserted implant to its neighboring tissues is thereby obtained.

The failures (below 10 per cent) may be blamed on initial errors in designing and constructing the implants by miscalculation of the prosthetic load expected.

All inserted partial and complete implant dentures were worn for about five years, to the subjective satisfaction of the patients and to the objective satisfaction of the prosthodontist.

The cast implants were tolerated by the involved tissues. Healing was uneventful.

Only in two patients was the insertion of implant dentures associated with formation of oral abscesses which, however, healed without ulceration.

No unfavorable influence of the inserted implants on the general health of the patients was observed.

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## Roentgenology

### Roentgenoscopic examinations in diffuse symmetrical scleroderma and scleroderma circumscriptum

E. Macher and B. Brehler. *Hautarzt* 9:409-411 Nov. 1958

Scleroderma is a comparatively rare subacute or chronic dermatosis producing hardening of the affected parts of the skin. The disease usually is manifested by lesions in the oral cavity.

Two main varieties of the disease are recognized: (1) diffuse symmetrical scleroderma, the generalized type and (2) scleroderma circumscriptum, the localized type.

Although the cause still is unknown, the following conditions have been suggested as predisposing factors: (1) trauma; (2) disorders of the nervous system; (3) endocrine dysfunction and (4) miscellaneous disorders such as creatinuria, rheumatism, erysipelas and exanthema.

The disease usually occurs in women although occasionally children are affected.

Hypertrophy and subsequent degeneration of the connective tissue bundles occur and cause pressure atrophy of vessels and epidermal structures. When the lesions of the skin and oral mucosa are fully developed, the epithelium becomes thinner and hyperkeratinized, and the papillary elevations become flattened and disappear gradually. The normal underlying connective tissue is replaced by dense collagenous fibers with reduced cellularity and vascularity. The sebaceous, salivary and sweat glands become atrophic.

In diffuse symmetrical scleroderma the sites most frequently affected are the extremities, the trunk, the face and the oral cavity. The face becomes maskoid.

In scleroderma circumscriptum the plaques most frequently appear on the breast, the head, the face, but rarely in the oral cavity. Occasionally these plaques disappear spontaneously but usually they change to permanent atrophic circumscribed lesions.

Lesions of the oral mucosa appear as white, indurated patches or as scarring of the tissues. The gingivae sometimes are involved. Case reports describe an involvement of the tongue, the soft palate and the larynx.

Even electron microscopic examinations often cannot differentiate the pathologic changes occurring in the finer structures. Roentgenoscopic (roentgen interference) studies of skin and mucosa specimens were made at the Dermatological Clinic of the University of Marburg/Lahn, Germany. The extremely hard mucosa and the periodontal membrane showed thickening of the vascular walls and pigmentation. The submucosa showed an accellular and dense collagen accumulation in which the outlines of the fibrils were indistinct.

Roentgenoscopy, by using the ray interference technic and the Debye-Scherrer diagraph, proved to be the best available method for making an accurate pathologic diagnosis and differential diagnosis in the initial stages of both types of scleroderma. The early pathologic changes in the supermolecular particles of the skin and the oral mucosa can be recognized better under the roentgenoscope than is possible under the electron microscope.

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### Roentgen diagnosis by remote control: telefluoroscopy and cineradiography

A. Jutras and G. Duckett. *M.Mundi* 4:77-82 Jan. 1959

Diagnostic roentgenography has developed to such a degree that the lack of skilled roentgenologists, the increasing cost of the x-ray equipment and the growing complexity of equipment manipulation are becoming major problems in medical and dental practice. Most efforts of inventors and manufacturers in this field have resulted in the introduction of more numerous and exacting procedures.

Diagnostic roentgenography could be simplified, accelerated and improved by means of ade-

quate automation. Standard procedures compel the roentgenologist to spend a large part of his working hours imprisoned in a closed dark room where he is flooded by invisible rays threatening his health. He exhausts his mental and physical energies in a sort of athletic performance which will be the laughing stock of future generations. Cineroentgenography, combined with television, offers a threefold advantage to roentgen diagnosis: (1) fluoroscopy in daylight; (2) more efficient and accurate service to a larger number of patients, and (3) rapid transmission of diagnostic information to attending physicians, dentists and surgeons.

To adopt telefluoroscopy and cineroentgenography as the normal method to start roentgen examinations and to reverse the roentgenograms for special investigations, is an unusual technic for those practitioners with inveterate habits and may seem fanciful. The idea of roentgen diagnosis by remote control no doubt will be opposed by those practitioners who tend to cling to standard manipulations. The use of electronics in the new setup extends not only to remote control cineroentgenography, television and radiophonic communication, but even the use of computers and automatic storage as well as redistribution of information is foreseen. Some of these technics are already being employed by the color television industry where broadcasts (in color) are recorded on magnetic tape for rebroadcasting over several stations.

Two image intensifiers, one attached to a motion picture camera and the other to a television camera, form the nucleus of the new apparatus. The Arriflex movie camera is equipped with a reflex viewer which permits visual selection and control of the field being investigated. A monitor, fed by the television camera, is located in the x-ray control room immediately adjacent to the examination room. The roentgenologist views the action in the examination room through a lead glass window. He controls the cineroentgenographic demonstration on the monitor. When he is satisfied that the patient is properly positioned, he shifts and places the image intensifier with the motion picture camera in the viewing position by remote control. Then he presses the exposure button to run off the film strip. A ring stand allows the patient to be examined in any position because the entire apparatus can be rotated without changing the relative position of the x-ray tube, the table top and the image intensifiers.

Electronic reproduction of the films solves competently and scientifically one of the most difficult problems of diagnostic roentgenography. Roentgenograms are much improved when blacks and whites of the original are automatically corrected and adapted to the optimum shade of each small surface. The process reveals diagnostic details which previously were difficult to observe and accentuates sharpness, making the interpretation easier; it prevents, in many instances, the retaking of mediocre roentgenograms, thereby enriching scientific documentation.

Various existing devices were combined into a simple unit which permits the roentgenologist to accomplish most of his technical work on small films.

The possibility of registering roentgenographic information from a distance and under more adequate conditions of interpretation and analysis increases the efficiency of roentgenographic diagnosis. It enables the operator to enjoy a few leisure hours which he can devote to the improvement of his professional knowledge, for the purpose of transmitting it to others, thereby rendering a greater service to his patients and to his profession.

*Jean Talon Hospital, Montreal, Canada*

### The hard tissues of the teeth in radiation diseases: experimental observations

A. A. Prokhonchukov. *Stomat.,Moscow* 36:2:3-8 March-April 1957

Radioactive isotopes of phosphorus and calcium were used to study the state of mineral metabolism of the hard tissues of the teeth. Radiation sickness was induced in 174 white rats, and the animals were sacrificed at various stages.

Roentgen-ray irradiation of the rats produced noticeable changes in the hard tissues of the teeth in the form of a disturbance of the phosphorus-calcium metabolism, depending on the dose of the rays and the time elapsing after radiation. The changes in the teeth were dystrophic and could develop into structural morphological changes.

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### A microradiographic-microphotometric and x-ray diffraction study of human developing enamel

Erna Hammarlund-Essler. *Trans.Royal Schools Den.* 2:4:15-25, 1958

A radiomicrographic-microphotometric and micro x-ray diffraction study was carried out to determine the distribution and the nature of the mineral content of the developing enamel in human teeth. The material consisted of three tooth germs—of the central incisor, the cuspid and the second molar—from the left mandible of a full-term human fetus.

The results confirm earlier observations that the enamel which is formed closest to the dentin is highly mineralized. The thickness of this layer is about 20 microns. The enamel formed outside of this layer has a low degree of mineralization in the early stages, lower than that of the adjacent dentin. The difference in the degree of mineralization successively decreases between the inner layer and the subsequently formed adjacent enamel which originally had a low degree of mineralization.

In a certain stage of development of the enamel, the external layer is more highly mineralized than the adjacent underlying layer. This finding might help to explain the observation of Karlström (1931) that the outer layer of the enamel of unerupted teeth is harder than the adjacent inner layer. It may be interpreted as evidence of the thin external layer of the enamel, like the innermost layer, being mineralized to a high degree quicker than the bulk of the enamel.

The radiomicrographic-microphotometric findings argue against the assertion of Diamond and Weinmann (1940) that amelogenesis can be divided into two separate phases. As far as mineralization is concerned, distinct stages cannot be recognized. Mineralization is a continuous process.

A comparison between micro x-ray diffractograms from young regions of enamel with low mineral content and older regions with high mineral content showed that crystallites of the same type occurred in all the regions studied. The diffractograms also showed practically the same characteristics as did those of enamel apatite of erupted teeth. This suggests that even in early stages of development the crystallites in the enamel are much better oriented and larger than those in dentin.

It is probable that the increase in the degree of mineralization of the developing enamel is caused mainly by an increase in the number of crystallites rather than by the postulated growth in size of existent crystal nuclei in the enamel matrix.

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### Tomography of the bones of the maxillofacial region: the Hirtz position

P. Mounier-Kuhn, J. Gaillard, J. Bonnefoy and H. Lafon. *Ann.otolaryng.* 75:582-591 Sept. 1958

Body section roentgenography (laminagraphy or tomography, which differ slightly) of the bones of the maxillofacial region, performed with the patient in the Hirtz position, may be a valuable adjunct in investigating the possible involvement of the maxillary sinuses, the pterygomaxillary spaces and the ethmoid bone by malignant tumors or metastases.

Body section roentgenography reveals details in this region which cannot be demonstrated by customary roentgenography or by direct examination.

The Hirtz position requires placing the patient on the chair with a maximum extension of his head. Section roentgenograms are taken at 13, 14 and 15 cm. distances slightly below the vertex cranii. When the images of the other structures are blurred, the osseous as well as the soft tissues of the entire maxillofacial region can be studied. A series of tomograms and laminagrams exemplify the value of this technic for early detection of atypical tumors in the maxillofacial region.

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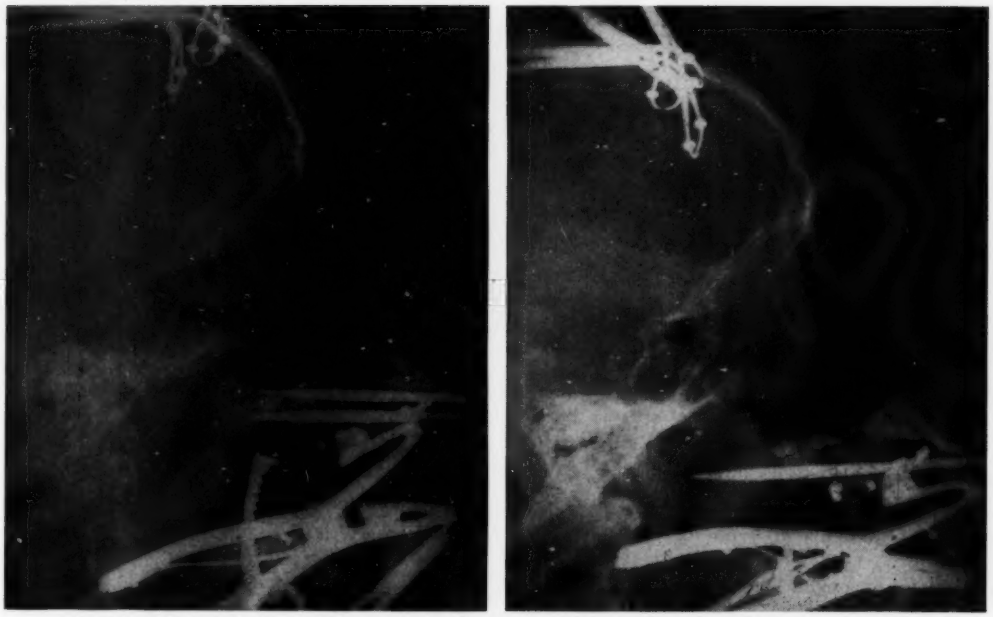

*Left: Distance from hemostat to needle. Right: hemostat is on or immediately adjacent to needle*

Case reports

**Removal of a broken needle**

Guy W. Smith, Roscoe Baker
and William T. Oberto. *J.Colorado D.A.*
37:9-14 June 1959

A 16 year old boy was referred to the authors' office for removal of a portion of a 30 gauge needle which had become embedded several weeks previously.

Roentgenograms made in the lateral and anterior positions to indicate the relation of the needle to the ramus of the left side of the mandible showed the broken needle to be positioned higher and farther back than the induction point in an ordinary mandibular block. Either the natural movements of the muscles of the jaw had moved it upward and backward or it had been pushed from its original position by attempts at recovery.

The patient was admitted to the hospital for oral surgery. In the operating room, after a general anesthetic was administered, a mouth gag was placed between the patient's teeth on the right side. The operative region lay between the ramus of the mandible and the tuberosity of the maxilla—a region about 1 cm. wide. A suction tip was used constantly to keep this field free of blood and secretions.

The original healed incision, which lay in a vertical position just inside the left ramus, was reopened and lengthened at both ends. It now extended from a point in the third molar region upward to the level of the coronoid process. This incision was deepened with a knife and the search was begun by blunt dissection with a small hemostat.

After the tissues had been separated for some distance, two hemostats were attached to firm fibers at points near where the needle was anticipated. An 8 by 10 inch roentgenogram (illustration, left) was made in a lateral position as the patient lay on the table. The roentgenogram shows the distance from the hemostats to the needle. The hemostat nearer the needle was used

as a fixed point and the search was continued with another hemostat. Then a third hemostat was attached to a firm fiber. Another roentgenogram was made, showing the needle ¼ inch from the pointer. For the third time, the dissection was continued in the direction of the needle. After progress to what appeared to be the proper point, a fourth hemostat was clamped firmly on a muscle or connective tissue fiber. Again a roentgenogram (illustration right) was made. This indicated that the hemostat was on or in the immediate neighborhood of the needle. With this hemostat in place, the dissecting was continued in all directions nearby. The handle of the hemostat was moved slightly, causing the distal end of the needle to come into view. The needle was easily removed with the hemostat as this was lifted from the surgical field. The flaps in the operative region were closed in the deep tissue with catgut. The edges of the mucous membrane were approximated and held with silk sutures.

When hemostats are fastened to fibers in the operative region, they serve as pointers regarding direction and depth of dissection necessary to reach a foreign body. In this instance, the needle was neither felt nor seen until the instant it was removed.

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## Mouth breathing

*J.A.M.A.* 169:660 Feb. 7, 1959

*Q.*—The patient, a 65 year old man, has had the following complaints, increasing in intensity for over six years. He states that after approximately one hour's sleep he is awakened by an extremely foul taste in his mouth and the tongue appears to be rough and "stiff as a board." The disturbance disappears when he sits up for about ten minutes. The condition reappears several times during the night, followed by headaches and fatigue. He also feels a "lump" in the mouth, seemingly "moving in different directions," associated with stiffness and numbness of the face. The patient's history reveals that he has had asthma intermittently since 1927. Please give suggestions on diagnosis and treatment.

*A.*—This patient apparently suffers from habitual mouth breathing, probably induced at least in part by allergic rhinitis with polyposis. Mouth breathing, especially during sleep, is apt to cause dryness of the mouth and tongue. After waking and sitting up the patient probably reverts to nasal breathing, and after the mouth and the tongue become moist again, he is able to go back to sleep. The impact of this disturbance on the patient is likely to be intensified by introspection and anxiety engendered by failure of therapeutic treatment to obtain relief. The recommended treatment includes explanation to the patient of the probable mechanism of his distress, treatment of the causative factors (especially of allergic rhinitis and polyposis by an otolaryngologist), and for temporary relief and as a therapeutic test, the use of nose drops containing naphazoline hydrochloride at bedtime and, if necessary, during the night.

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## Reaction to lipstick resembling subacute sinusitis

Harry M. Salzer.
*Eye, Ear, Nose & Throat Monthly* 37:253-258 April 1958

The patient, a 45 year old woman, complained that "the tongue feels as if it had been severely burned." An allergy test (cutaneous reaction) revealed that the patient was extremely sensitive to the type of long-lasting lipstick she used. Although the primary sensation of tongue burning cleared up within a few days, red spots remained on her tongue.

There were additional symptoms which resembled those of an acute coryza, a subacute pharyngitis and sinusitis.

Treatment consisted of antihistamines, throat lozenges, nasal sprays and infrared radiation over a period of ten weeks. However, there was no favorable response to the treatment. After a patch test confirmed the patient's sensitivity to a specific allergen, the red coal tar dye (eosin) used as coloring matter in the lipstick, she was willing to change to another lipstick type which did not contain eosin. Four days later, all symptoms disappeared including the red spots on the tongue, the sore throat, and the inflammation.

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Public health dentistry

## Caries-reducing effects of niobium and tantalum

Michael Winniker. *Zahnärztl.Praxis* 10:65-66 March 15, 1959

Investigations designed to determine whether some of the trace elements other than fluorine can produce caries-reducing effects were carried out at the Dental College of the Humboldt University of Berlin.

Rhygh and Geyer in animal and in vitro studies have demonstrated that the trace element vanadium produces caries-reducing effects and have recommended that vanadium should be used for treatment and prevention of dental caries.

Although niobium and tantalum are not natural constituents of human or animal tooth structures, the caries-preventive and caries-reducing effects of these two trace elements were studied and evaluated in 40 Syrian golden hamsters, 23 male and 17 female animals approximately six weeks old.

The experimental animals were divided into four groups as follows:

Group 1, consisting of five male and five female hamsters, received a normal diet consisting of oats, barley, vegetables and milk.

Group 2, consisting of five male and five female hamsters, received a cariogenic diet consisting of 500 Gm. sugar, 300 Gm. fine wheat flour, 380 Gm. maize, 150 Gm. powdered milk, 10 Gm. baking powder and 375 ml. distilled water.

Group 3, consisting of seven male and three female hamsters, received the cariogenic diet to which 0.02 mg. of sodium niobium (niobate) was added.

Group 4, consisting of six male and four female hamsters, received the cariogenic diet to which 0.02 mg. of sodium tantalum (tantalate) was added.

In Group 1, there were 16 carious molars (7 in the upper jaw and 9 in the lower jaw), showing a caries incidence of 13.3 per cent.

In Group 2, there were 45 carious molars (25 in the upper jaw and 20 in the lower jaw), showing a caries incidence of 37.5 per cent.

In Group 3, there were 25 carious molars (21 in the upper jaw and 4 in the lower jaw) showing a caries incidence of 20.6 per cent.

In Group 4, there were 33 carious molars (22 in the upper jaw and 11 in the lower jaw) showing a caries incidence of 27.5 per cent.

In the evaluation of the carious lesions only such defects were considered as could be diagnosed by using a magnifying glass or a cavity explorer (probe).

Carious lesions in the incisors were not evaluated because the incisors of hamsters are too different from human incisors to be considered worthwhile for comparative purposes. Syrian golden hamsters possess 12 molars, and the percentage of the caries incidence was determined by using the following formula:

$$\frac{\text{upper jaw \& lower jaw}}{12} = 100 \text{ per cent.}$$

No attempt was made to determine whether a difference in the caries incidence exists between male and female hamsters.

The difference in the caries incidence found between the four groups of experimental animals, however, was sufficiently significant that despite the comparatively small number of animals used in this study the findings could not be based on accidental observations. The similarity of the results with those of Münch who used vanadium (vanadate) and molybdenum (molybdate) in his animal studies seems to prove the authenticity of the investigation.

Comparison of the caries-reducing effects obtained by adding the trace elements vanadium, molybdenum, niobium and tantalum to the cariogenic diet given to Syrian golden hamsters (in molars only) gave the following results: (1) normal diet, a caries incidence of 13.3 per cent; (2) cariogenic diet, a caries incidence of 37.5 per cent; (3) cariogenic diet to which 0.04 mg. vanadate was added (daily), a caries incidence of 11.5 per cent; (4) cariogenic diet to which 0.02 mg. molybdate was added (daily), a caries

incidence of 12.0 per cent; (5) cariogenic diet to which 0.02 mg. niobate was added (daily), a caries incidence of 20.8 per cent, and (6) cariogenic diet to which 0.02 mg. tantalate was added (daily), a caries incidence of 27.5 per cent.

Histologic examinations of specimens taken from the liver and kidneys of all experimental animals proved that neither the cariogenic diet nor the doses of niobium and tantalum administered produced any unfavorable systemic changes.

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## Dairy products and dental health

James H. Shaw. *Nutrit.News* 22:1 Feb. 1959

Two lengthy experiments involving 669 caries-susceptible rats of two generations have been conducted, in which dairy products were compared for their influence on the incidence of dental caries during the posteruptive period, and during tooth development insofar as future resistance to caries was concerned.

In the first experiment, female rats were maintained from weaning through several reproductive cycles, either on a cariogenic diet alone or with supplements of milk, chocolate drink or chocolate milk which provided, respectively, 30, 30 and 35 per cent of the caloric needs. Their offspring were fed either the cariogenic diet exclusively throughout the experimentation period, or a dietary regimen consisting for the first six weeks of the dairy product exclusively, and thereafter for the remainder of the experimental period the cariogenic diet provided 67 per cent of the calories and the dairy product 33 per cent.

In the second experiment, female rats were fed mixtures of three dairy products throughout the reproductive cycles. The three dairy products provided 45 per cent of the caloric requirement: 30 per cent from milk or chocolate milk, 10 per cent from vanilla ice cream and 5 per cent from Cheddar cheese. The remainder of the calories were supplied by the cariogenic diet. The control rats received the cariogenic diet exclusively. Their offspring received either the cariogenic diet or a dietary regimen beginning with the same mixtures of dairy products exclusively for the first three weeks, and followed by a ration of 67 per cent of the calories from the cariogenic diet and 33 per cent from the dairy product. An additional group, after the diet of dairy products exclusively, then was maintained on a ratio of 75 per cent of the calories from the cariogenic diet and 25 per cent of the calories from the dairy product. Littermate comparisons were made in all the groups of these two experiments.

In all instances where the dairy products were fed from weaning throughout the posteruptive experimental periods, major reductions in the incidence of dental caries were observed in comparison with the caries incidence in littermates fed only the cariogenic diet. These reductions were observed where only one dairy product was fed, or where the combination of milk or chocolate milk, vanilla ice cream and Cheddar cheese was provided. Presumably, these reductions occurred because the dairy foods were readily cleared from the oral cavity and did not adhere to caries-susceptible tooth surfaces, or else the dairy foods influenced the oral environment beneficially in some other way.

Accurate prediction of the relationship of comparable levels of dairy product consumption among human populations to dental caries incidence cannot be made until comparable clinical trials are conducted.

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## Experimental dental caries in young albino rats

D. Stransky, M. Bantshev and D. Maslinkov. *Stomat.,Sofia* 7:273-278 May 1958

Previous investigations by the authors and other dental researchers have indicated that a relationship exists between the diet consumed by pregnant women and the incidence of caries in their children.

Recent studies, made at the Dental School of the University of Sofia, Bulgaria, were designed to demonstrate the amount of carious lesions in the offspring of albino rats which received during pregnancy a cariogenic diet (Bruszt) consisting of minimum amounts of proteins and maximum amounts of carbohydrates. The data

obtained were compared with those of the control group, the offspring of albino rats (of the same strain) who were fed a normal diet during pregnancy.

Although the incidence of caries observed in both groups of young rats appeared to be somewhat less than previously reported, the offspring of rats fed the cariogenic diet during pregnancy showed a frequency of carious lesions three times higher than the offspring of rats fed the normal diet. The experimental period extended from birth to the fifth month of life.

The data obtained seem to indicate that consumption of a highly cariogenic diet by pregnant animals (including man) increases significantly the incidence of caries in the offspring. This increase becomes manifest in the deciduous teeth almost immediately after eruption.

Although further research with other animal species and man is necessary before final conclusions can be made, it appears certain that disturbances caused by prenatal nutritional deficiencies play a major role in the development of caries in the offspring, especially by decreasing the resistance to caries.

These prenatal disturbances may play a more significant part in postnatal susceptibility to caries than the pH value of the saliva or the contents of the oral flora.

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### The Hastings fluoridation project: I. Dental effects between 1954 and 1957

T. G. Ludwig. *New Zealand D.J.* 54:165-172 Oct. 1958

In September 1954 the fluoride content of the water supply in Hastings, New Zealand, was raised to 1.0 ppm. Between September and November 1954, base-line dental examinations of 1,869 children were completed. The subjects represented all children of European extraction who had lived in the city throughout life, who consumed only the city water, who were between the ages of 5 and 16 years at the time of examination, and who were attending school on the day of the dental examiner's visit. During March and April 1957, dental examinations of 1,868 Hastings children were carried out, the conditions governing the selection of subject being identical with those in 1954. There had been a period of intermittent fluoridation between March 1953 and September 1954; the children examined in 1957 had been exposed to a continuous optimal level of 1 ppm fluoride for from 27 to 30 months longer than the children examined in 1954.

In six-year-old Hastings children, the number of permanent teeth with evidence of caries experience fell from 1.41 per child in 1954 to 0.82 per child in 1957, a reduction of about 42 per cent in the amount of caries affecting the permanent teeth of children of this age. In seven-year-old children the reduction in caries affecting the permanent teeth was about 39 per cent (from 2.75 to 1.69 per child), and in eight-year-old children the reduction was about 18 per cent (from 3.73 to 3.07 carious permanent teeth per child). Although slight reductions in the amount of caries affecting the permanent teeth of Hastings children over nine years old had occurred, none of these changes was statistically significant.

The number of deciduous teeth affected by caries in five-year-old children fell from 8.40 per child in 1954 to 7.24 per child in 1957, a reduction of about 14 per cent. No instance of dental fluorosis was observed, and there was no significant change in the prevalence of idiopathic enamel defects among children resident in Hastings.

The results generally conform to those obtained in overseas studies when the length of exposure of subjects to fluoridated water was of similar duration.

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### Clinical experience with Reverin, a new broad-spectrum antibiotic, injected intravenously

K. F. Albrecht. *Chirurg* 29:445-448 Oct. 1958

"Reverin" is the proprietary name given to a new German antibiotic preparation, pyrrolidinomethyl tetracycline, which had been developed by partial synthesis from pure tetracycline.

This new tetracycline derivative shows in physiologic pH solutions a definitely improved solubility, superior to that of other tetracyclines.

Its strength of action and broadness of spectrum are at least equivalent to those of tetracycline hydrochloride.

Reverin was administered intravenously to 174 patients with inflammatory conditions of the oral cavity at the Oral Surgical Clinic of the University of Marburg/Lahn, Germany.

In most of these patients one intravenous injection of 275 mg. of Reverin daily for four to seven days was sufficient for preventive and therapeutic purposes. Patients with severe oral inflammations or with infections caused by pathogenic agents who had showed a reduced sensitivity to other tetracycline derivatives were given two injections daily. One injection of 5 to 25 mg. of Reverin per kilogram body weight proved to be sufficient in children.

The satisfactory local tolerance of Reverin made it possible to perform the intravenous injection within one minute. The resulting high initial concentration in the serum undoubtedly is of essential clinical significance. No signs of irritation were observed in the veins even after repeated injections into the same blood vessel. No undesirable side effects were observed except for the insignificant sensation of bitter taste on the tongue which occurred in about 70 per cent of the patients.

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### Hazards of antibiotic therapy

Wallace E. Herrell. *J.A.M.A.* 168:1875-1879 Dec. 6, 1958

Some may feel that the hazards of antibiotic therapy have been overemphasized. A discussion of this subject, however, is more important today than it has been at any time since the introduction of antibiotics almost 20 years ago. Nearly 20 antibiotics are clinically available. The reactions of toxicity that may be encountered after administration of the most commonly used antibiotics may be classified as minor (non-life-endangering) or major (life-endangering and fatal) hazards.

The indiscriminate use of antibiotics has created serious problems. Before any antibiotic agent is administered, the patient should be questioned as to the evidence of sensitivity. After administration, he should be watched by the practitioner or his assistant for at least 30 minutes.

Reactions, if they occur, should be treated with epinephrine or with steroids intravenously injected and not with oxygen inhalation.

Use of streptomycin is rarely followed by major complications, but its minor side effects include contact dermatitis, and the drug's toxic effect on the eighth cranial nerve, although not life-endangering, is distressing. Preliminary studies indicate that dihydrodesoxystreptomycin is less toxic.

The fact that the tetracyclines have proved to be highly effective and that they can be administered orally has resulted in a widespread misuse of these drugs. Tetracyclines can cause blood dyscrasia and anaphylactic reactions, but the most serious major hazard is the occurrence of superimposed staphylococcic enterocolitis and wound infections.

There exists a definite association between chloramphenicol administration and the occurrence of aplastic anemia.

The rational use of antibiotics in the future depends on the return to strict aseptic technics. The occasional temporary exclusion of one or more antibiotic agents from routine administration—long enough for the common pathogens to regain their sensitivity to the specific antibiotic—would greatly improve the antimicrobic effectiveness and increase the safety of antibiotic therapy.

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## Stomatitis and proctitis as manifestations of meprobamate idiosyncrasy

Jonas Brachfeld and E. Cooper Bell. *J.A.M.A.* 169:1321-1322 March 21, 1959

A 51 year old woman was admitted on June 23, 1958, to Woman's Hospital, Philadelphia, because of a myocardial infarction. Because of restlessness during the day, and sleeplessness, therapy with meprobamate, 400 mg. given four times a day, and secobarbital and phenobarbital given at bedtime was started on July 11. The patient received two tablets of meprobamate on that day, and the next morning she remarked that she was "allergic to tranquilizers" and that her mouth felt sore. Meprobamate therapy therefore was discontinued. A few shallow ulcers were noted on her oral mucosa on July 11. By July 14 this had progressed to extensive sloughing ulceration of the mucosa of inner cheeks, tongue and palate. The patient complained of severe soreness of her mouth, to the point that she had difficulty swallowing liquids, as well as general malaise and severe itching and burning of the anal region. Her temperature rose to 100.4°F. She appeared acutely ill. Her cervical lymph nodes were swollen and tender. The dental consultant stated that the lesion was typical of necrotizing ulcerative gingivitis and that acute moniliasis and herpetic stomatitis could be ruled out.

On July 15 the patient noted one episode of anal bleeding. She had no other gastrointestinal signs or symptoms.

At this point, additional history revealed the nature of her previous reactions to meprobamate. In July 1957 she had been given meprobamate for the first time. Within 24 hours after taking 400 mg. of the drug she had extensive blistering of the mucosa of the lips and tongue, and severe itching and burning in the oral region. She was assured then that the symptoms were unrelated to the drug. In March 1958, after ingestion of a single tablet of meprobamate, her mouth "felt severely swollen" but this subsided gradually. An extensive history failed to disclose stomatitis on any previous occasion, intolerance to other drugs or foods, or any typical symptoms of allergic reactions.

In view of this history, cortisone acetate medication was started, 50 mg. by mouth every four hours. The patient improved greatly in 24 hours. The extensive ulcerations gradually disappeared in the ensuing days, during which time cortisone dosage was slowly tapered off and then discontinued. Microscopic examination of a mouth swab on July 14 was negative for fungi and Vincent's bacillus.

Charkes (1958), in a review of the problem of meprobamate idiosyncrasy, said that about 1 patient in 200 may have an anaphylactoid response to an initial administration of meprobamate. Antihistamines have not produced significant relief in these conditions. Steroid therapy often has been helpful. Levan (1957) states that the cutaneous reactions to meprobamate are characterized by (1) their early appearance (sometimes as early as 15 minutes); (2) a severe erythematous rash, at times purpuric, tending to be particularly severe in the groin; and (3) associated pronounced weakness and transient but recurrent syncope.

So far as is known, no instance of meprobamate idiosyncrasy with mucotaneous manifestations consisting solely of stomatitis and proctitis has been reported. This reaction must be extremely rare in view of the tremendous use of this drug. Local and other etiologic factors should be considered carefully before stomatitis or proctitis is attributed to the intake of meprobamate. Charkes emphasizes that with the administration of a test dose, the second reaction could be much more severe than the first. This was inadvertently demonstrated in the aforementioned patient. If a test dose is given, no more than 50 mg. should be tried.

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Dentistry around the world

## Some impressions on dentistry in New Zealand

Ivor E. Whitling. *Brit.D.J.* 106:49-51 Jan. 20, 1959

Confronted with a shortage of dentists, the Health Department in New Zealand has trained dental nurses to treat the younger children. These nurses receive a two year training in special colleges, to prepare them to fill or extract deciduous and permanent teeth, and to instruct children in dental hygiene and home care. The nurses learn nothing of prosthetic work, roentgenology, crown and bridge work, gold and porcelain inlays, periodontal disease and its treatment, or general anesthetics; for help with matters outside their ken, they can call on the principal dental officer or a local practitioner. Some knowledge of orthodontics is imparted to the nurses so that they can recognize early abnormalities and refer the patients to dentists.

The nurses work in light, airy surgeries, in clinics usually located inside the grounds of the largest school in the district, close to the main source of patients. The nurses have time to play with the children and help them get used to their surroundings. Although the nurse may not see as many patients each day as would a busy dentist, the children learn to be more willing and cooperative—a result that repays vast dividends to the dentist later on.

Most dentists are enthusiastic about the standard of work performed by the nurses, and about the fact that when the time comes for the dentist to take over the treatment of the child at about 12 years of age, the child is a well-trained, cooperative patient, with his mouth in good condition.

Part of the work of most New Zealand dentists consists of treating children in the age group from 12 to 16 years. The scale of fees is comparable to that in England. In private practice, fees in New Zealand for conservative work are about the same as those in England, but much higher for prosthetic work.

Generally, the dentist in New Zealand seems comfortably off, and appears to work at half the pressure of a busy, mixed practice in England. The standard of equipment in the dental offices is good.

The extensive school dental service is bringing great benefit to the teeth of the younger generation. Great efforts are being made to introduce fluoridation on a wide scale. A pilot program has been running in the city of Hastings for some few years; the findings of the Commission of Enquiry are wholly favorable to the experiment.

Dentistry in New Zealand appears to be a more pleasant occupation than it is in the United Kingdom, with the reservation that the emphasis is on prosthetics in New Zealand.

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## Dental education in Turkey

Ch. Böhne. *Zahnärztl.Praxis* 9:179 Aug. 1, 1958

The only college of dentistry in Turkey is a part of the medical faculty of the University of Istanbul. The dental school accepts from 70 to 80 students every year, and graduates about 50.

The University of Ankara, reorganized in 1951, plans the foundation of a dental college, to be associated with the medical faculty, for the near future.

Although college education in Turkey is free, board and lodging are comparatively expensive. For dental students who show the ability to pass the courses at a high level, the Turkish government provides scholarships.

Applicants to the Dental College of the University of Istanbul must have at least five years of primary and six years of secondary education. After admission to the college, they enroll in predental courses which consist of biology (anatomy, physiology, bacteriology, pharmacology and toxicology), botany, chemistry, medicine (pathology, diagnosis, therapy and prevention of diseases), physics and zoology (anthropology). For dental general practitioners who want to be-

come dental specialists, postgraduate courses in the branches of dentistry selected are available.

Immediately after graduation from the dental college, the young dentist is called to serve in the Turkish armed forces as a dental officer (second lieutenant) for at least 18 months.

Turkey urgently needs more and better trained dentists and, therefore, more dental schools with adequate research facilities. In 1938, the dentist-patient ratio was 1 to 18,000; today, although the ratio, 1 to 7,500, is more favorable, the average dental general practitioner is forced to work more than ten hours daily.

Dental fees are government regulated and considered inadequate. The Turkish Dental Association is seeking to bring about certain changes in fee regulations to provide the dental profession with a more favorable economic and social standard.

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### Acupuncture and moxa cautery in Chinese and Japanese dentistry

H. J. Hering. *Zahnärztl.Welt & Reform* 59:654-655 Dec. 10, 1958

The ancient art of acupuncture combined with moxa cautery, probably developed by Pen T'sao (2697 B.C.) and Huang Ti (2598 B.C.), was transmitted from China to Japan, and in the seventeenth century to Europe. Recently, this method has been investigated by American, Asian and European researchers who—with some reservations—found it applicable for treatment of pain-producing conditions in the maxillofacial region.

Acupuncture is performed by pricking the affected region with needles, from 3 to 24 cm. long. The operator usually introduces the needles into the diseased tissue during inhalation, rotates them rhythmically and withdraws them at expiration. According to the Chinese beliefs acupuncture should be used in conditions in which the dual forces of "Yang" and "Yin" (life and death or health and disease) are in imbalance. In healthy people Yang and Yin are in perfect harmony. Disease follows the course of specific routes of which the one from the little toe to the tip of the tongue is significant for Chinese and Japanese dentistry.

The supplementary treatment method, moxa cautery, consists of placing small cones of moxa, a soft woolly mass prepared from young leaves of the Chinese wormwood (*Artemisia moxa*), on the skin or mucous membrane directly over the diseased region. The caustic effect is obtained by igniting the cones. The patient remains immobile until the moxa cones have finished burning.

The Swedish physician Karl Peter Thunberg (1775) and the German physician Franz von Siebold (1826) reported on acupuncture and moxa cautery used in Japan. Members of three professions: Kotsju kwa (dentists), Sin si (needle surgeons) and Kiusi (cauterizers) employed these methods in the treatment of inflammations in the oral cavity.

Recently, Leung Tit Sang of the Sierra States College in Los Angeles, California, mentioned that acupuncture and moxa cautery in the hands of "talented" healers may be valuable adjuvants in the treatment of oral and dental diseases but should not be used if the operator does not possess adequate knowledge and experience. Supplemented by recent clinical examination methods, these ancient East Asian technics may prove useful in the diagnosis and treatment of trigeminal neuralgia, trismus, pulpitis, gingivitis, stomatitis, periodontal disease, aphthae and rhagades according to Vacelet (1956).

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Education

**Present status of student research in North American dental schools**

Edward J. Beadle. *Penn D.J.* 62:9-12 Dec. 1958

A questionnaire on undergraduate dental student research was distributed to the 46 United States and 5 Canadian dental schools. Questionnaires were returned from 49 of the schools. A tabulation of the results shows the following:

1. Forty of the 46 United States schools and 1 of the 5 Canadian schools train undergraduate students in dental research. Thirty-nine (83 per cent) of the United States dental schools have undergraduate students working under grants of the United States Public Health Service, and 38 of these schools have part-time undergraduate fellowships.

2. Thirty-eight of the 46 United States dental schools and 4 of the 5 Canadian schools have undergraduate students aiding faculty members in dental school research activities.

3. Thirty-seven United States schools and four Canadian schools have undergraduate students conducting research during summer vacation.

4. Twenty-three (50 per cent) of the 46 United States dental schools have undergraduate students doing independent research. Only six of these schools have 15 per cent or more of the total number of students participating in such independent research. Harvard University reports that seven of its students in the past seven years have presented their undergraduate research projects at annual national meetings of the International Association for Dental Research. Harvard further reports that in the last six years, 21 research papers by 21 of its students have appeared in the literature.

5. Ten United States dental schools have students holding postsophomore fellowships, with stipend levels as determined by the institution up to $3,200 annually. These fellowship students must have completed one academic year in professional school; the students then leave the regular professional curriculum for from one to three years to obtain research training. An additional $500 allowance is provided for a spouse and each child; tuition fees can be covered when need is indicated. Seventeen students are now holding such fellowships.

6. Five dental schools have six undergraduate dental students holding USPHS predoctoral fellowships, awarded to qualified persons having a bachelor's degree or equivalent training. Participants are expected to carry on studies oriented toward graduate work in fields relating to the dental health sciences. Awards up to three years are available, carrying stipends ranging from $1,800 for the first year to $2,200 for the last year, with an additional $500 for a spouse and for each child.

In January 1959, USPHS postdoctoral fellowships became available for up to three years, with grants ranging from $4,500 for the first year to $5,500 for the third year, with $500 for a spouse and for each child. Such fellowships are for those desiring additional training for careers in teaching and research.

Five of the 49 schools responding reported having undergraduate research societies sponsored by the students. At two schools students are invited to faculty research discussions. At two schools students attend local meetings of the I.A.D.R.

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### Satisfactory confirmation

Editorial. *Rev.A.odont.,Argentina* 46:277 Aug. 1958

The recent strike of practitioners of the healing arts in Argentina uncovered an abundance of moral reserves and energies within the professions. Members of the dental profession met the emergency energetically. The numerous meetings held on short notice were attended by unusually large numbers of dentists of all ages and ranks, from different institutions, public and private, holding divergent opinions in many instances, but all caught up in the common devotion with which they gave their time and their enthusiasm to a cause in which they believed, because it touched their dignity as university graduates.

Whereas members of the dental profession can be satisfied with their part in these events, even greater cause for satisfaction can be found in the solidarity of all the healing professions.

*Junin 959, Buenos Aires, Argentina*

### International Society for Hypnosis

A. A. Mason. *Brit.M.J.* No. 5102:980 Oct. 18, 1958

On October 5, 1958, the International Society for Clinical and Experimental Hypnosis was inaugurated. This society has branches in England, the United States, Argentina, Australia, Brazil, Canada, Chile, Denmark, Germany, Japan, the Netherlands, Norway, Sweden and South Africa. Branches also are being formed in France and Italy.

The British section of the society has 124 members and publishes a quarterly journal, the "International Journal of Clinical and Experimental Hypnosis." The society consists of medical and dental practitioners and psychologists, and is divided into fellows, members and associate members. An American board of examiners in clinical hypnosis has been formed with divisions for medicine, dentistry and psychology. This board is patterned after the examining boards of the American Medical Association.

The formation of the society is a major step forward to allow hypnotism to take a reasonable place beside other therapies. The aims of the group, apart from teaching and the exchange of knowledge on hypnotism, include a scientific and unprejudiced assessment of its value. The preponderance on the board of directors of the society of many eminent experimental psychologists and psychiatrists from the major American hospitals should make these aims realizable.

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### Michigan Association of the Professions

*J.Michigan D.A.* 40:219-220 Sept. 1958

Representatives of five professional associations met in Lansing recently to discuss organization plans for a Michigan Association of the Professions. The organizations represented are the Michigan Society of Architects, Michigan State Medical Society, Michigan Society of Professional Engineers, State Bar of Michigan, and the Michigan State Dental Association. This is believed to be the first time that officials of all these professions have joined in an attempt to solve common problems.

A statement of purposes for the association, presented by Lester P. Dodd, past president of the State Bar of Michigan, listed the following objectives:

". . . the encouragement of participation of all the professions in programs having for their purpose the advancement of professional ideals and professional welfare;

". . . the promotion of better understanding between and among the several professions;

". . . the promotion of a free interchange of opinion and information among its members on subjects of mutual professional interest;

". . . the promotion of closer contact between the leaders of the learned professions;

". . . the fostering of ever higher standards of professional ethics and conduct;

". . . the promotion of programs and measures designed to protect the public and the professions against encroachments on professional practice by those not qualified;

". . . the promotion of programs designed to offer professional and pre-professional students more adequate preparation for professional life;

". . . the promotion of programs and measures designed to assist young professionals in meeting the problems of their respective professions;

". . . the stimulation and fostering of leadership by the professions in public service activities on community, state and national levels . . ."

Representatives of all the professions at the meeting accepted, in principle, this concept of an association of the professions. Delegates from the five professions were instructed to meet September 14 to discuss organizational details and draw up articles of incorporation.

Trustees of the Michigan State Dental Association have endorsed the principles of such a professional association. "An association of the professions holds great potential value for all the groups concerned and we are very pleased to be able to participate in the early planning for its organization," stated J. P. Beukema, president of the Michigan State Dental Association.

*112 East Allegan, Lansing 68, Mich.*

### Opportunities through study clubs

George W. Redpath. *J.Am.Col.Den.* 25:81-84 June 1958

The Oregon Association for Dental Research, Inc., was formed in March 1952. Funds to equip its quarters were obtained from the Oregon State Board of Dental Examiners. The quarters, conveniently located in a low-rent area of Portland, are equipped with five complete dental units and a laboratory. Any person licensed to practice dentistry and a member of a participating study club is eligible for membership in the corporation. The initiation fee for a participating study club is $300. Dues of $25 per month are collected from each club. The corporation has an annual meeting at which directors are elected. The board of directors meets every 60 days. Directors receive no compensation. There are now 13 study clubs in the corporation. Each club is an entity, and has a membership of 10 to 12 men. Each elects its own officers, has its own instructors, and determines its membership fees. Some of these clubs have existed for a long time; for example, the Portland Prosthetic Study and Research Club is now in its seventeenth year.

Other study groups function throughout the state. The Associated Gold Foil Study Clubs is comprised of six clubs. The Northwest Academy of Dental Medicine meets regularly and holds a yearly seminar. A Pedodontics Club, a Prosthetic Club, a Periodontia Club and a Gnathological Society meet at the University of Oregon Dental School. The dental school provides space for these clubs and treats them as continuing postgraduate courses.

In Seattle, Wash., 30 dental study clubs meet regularly. Six of these clubs received their start through courses offered at the University of Washington Dental School. Twenty of the 30 study clubs meet regularly at the study club rooms in the Medical and Dental Building, which are maintained by the Seattle District Dental Society. Each club pays rental to the society at the rate of $1.50 per member per month on a nine-month basis. The additional cost per member in the various study clubs depends on the honorarium paid to the study club leader; this may range from $50 to $75 per meeting.

In Vancouver, 11 study clubs function. Many study clubs throughout the United States have been in existence for a long time. The Woodbury Gold Foil Club of Omaha, Neb., for instance, recently observed its fiftieth anniversary.

*318 Medical Dental Building, Portland, Ore.*

### Confederation of medical and related professions

*Rev.Fed.odont.Colombiana* 8:79-81 July-Aug. 1958

On August 12, 1958, the Federación Médica Colombiana, the Federación Odontológica Colombiana, the Colegio Colombiana de Químicos Farmaceuticos, and the Asociación Colombiana de Médicos Veterinarios Zootecnistas adopted a resolution establishing the Confederation of Medical and Related Professions (Confederación de Profesiones Médicas y Afines).

The primary purposes of this Confederation as set forth in the resolution are: (1) to collaborate in an effective manner in every project which, emanating from any authority, contributes to the improvement of the public health; (2) to recommend and publicize those health programs which the Confederation believes to be advantageous to the community; (3) to campaign for just laws to regulate the liberal professions, and (4) to tighten the bonds of friendship between members of all the professions belonging to the Confederation.

*Calle 16, 7-91, Bogota, Colombia*


**Nitrous oxide-ether-chloroform**

J. Menzies Campbell. *D.Practitioner* 9:116-119 Jan. 1959

The dental profession can be proud of the roles played by four of its members in the early days of general anesthesia: Horace H. Wells (1815-1848), William Thomas Green Morton (1819-1868), James Robinson (1813-1862) and Francis Brodie Imlach (1819-1891).

Horace Wells, a dentist practicing in Hartford, Conn., on December 10, 1844, was present at a public demonstration of the exhilarating effects of nitrous oxide, administered by an itinerant lecturer. Wells was convinced that this gas could eliminate pain in surgical operations. He arranged with Gardner Q. Colton, the lecturer, to bring the gas and apparatus to his office the following morning. To convince himself of the reliability of nitrous oxide, Wells decided to have one of his own teeth extracted by John M. Riggs in the presence of a few friends. The extraction was performed painlessly and the patient recovered promptly and satisfactorily. Wells continued to experiment with nitrous oxide, and his reputation as a painless dentist became so great that sufferers from dental diseases thronged to his office. Wells was anxious to make the discovery universally known. He went to Boston and called on W. T. G. Morton and C. T. Jackson, who introduced him to J. C. Warren, a surgeon attached to the Massachusetts General Hospital. It was arranged for Wells, in January 1845, to explain his discovery before members of the hospital staff and students, to anesthetize a patient with nitrous oxide and then extract a tooth. The operation proved unsuccessful; the patient groaned and complained that he had experienced considerable pain. Chagrined, Wells returned to Hartford and resumed his dental practice. It is rightfully accepted that Wells was the discoverer of the anesthetic properties of nitrous oxide.

Morton practiced as a dentist in Boston; earlier, he had been associated with Wells, first as an apprentice and later in a brief partnership. He administered ether to his patients to eliminate the pain resulting from dental extractions. Eventually, Morton persuaded J. C. Warren to permit him to demonstrate the anesthetic effects of ether on a patient in Massachusetts General Hospital. This he did on October 16, 1846. Successful anesthesia was attained, both that day and the following day on another patient. Unfortunately, an acrimonious controversy subsequently developed with, among others, C. T. Jackson, who disputed Morton's claim to priority.

James Robinson, who practiced in Gower Street, London, on December 19, 1846, was the first person to perform an operation in Great Britain with the patient under the anesthetic influence of ether. Robinson had devised the ether inhaler used on this and subsequent patients; the inhaler, it is believed, was first marketed on January 10, 1847. It had been constructed by Mr. Hooper in accordance with Robinson's specifications. Robinson continued to experiment with ether, and an instructive work by him was published in the March 13, 1847, issue of *The Lancet*.

Imlach was an Edinburgh surgeon who restricted his practice to dentistry. Early in November 1847 he extracted a tooth from a patient who was under the anesthetic influence of chloroform which had been applied on a thin white cotton handkerchief. Within nine months, Imlach had administered chloroform to almost 300 patients, without a single fatality or accident.

*70 Great George Street, Glasgow W.2, Scotland*

Forensic dentistry

## The assessment of age from the dentition

A. E. W. Miles. *Proc.Roy.Soc.Med.* 51:1057-1060 Dec. 1958

Age assessment is one of the most important problems of forensic dentistry. During the period of tooth development up to about the age of 20 years, it is possible to assess age from the teeth and jaws with a moderately high degree of accuracy. Between 14 and 20 years the accuracy diminishes progressively as increasing reliance has to be placed on one tooth only; namely, the third molar, which appears to be more variable in its time of development than other teeth.

To assess age during the period of tooth development, recourse is made to tables of the chronology of tooth development, the diagrammatic table prepared by Schour and Massler (1941) being the most commonly used. To test the accuracy with which age could be assessed by the Schour and Massler table, the ages of 58 English children were estimated from lateral jaw roentgenograms of the molars. Up to the age of about 12 years, most estimates fell near the real age, few being more than a year off. Over the age of 12 years, however, many estimates were off by two years or more. The fact that the estimates fell about equally above and below the line suggests that the table of Schour and Massler is accurate for English children up to 12 years old, but that in later childhood there is a considerable range of variation in the chronology of tooth development.

Clements and others (1953) have provided extremely useful data on the chronology of clinical tooth eruption in English children. The exhaustive study of the chronology of development of the mandibular first permanent molar in American children, published by Gleiser and Hunt (1955), is a model of its kind; if extended to other parts of the dentition it would be of enormous forensic value.

Recently, estimations were made of the ages of 47 skulls of persons from the early part of the last century, taken from a burial ground in London. The real ages were known from data on the coffins. In making the estimates, account was taken only of the teeth and jaws, other features being ignored. The estimates of the ages of skulls of persons below the age of 35 years were fairly close to the real ages; between the ages of 40 and 70 years there was a good deal of scatter. All the estimates for skulls over the age of 70 years fell well below the chronological ages. The age estimates were made by a subjective evaluation of a number of factors, principally attrition, the condition of the supporting tissues of the teeth and the thickness of the cementum.

Gustafson (1950) has evolved a method which is more scientific and which undoubtedly would have given a more accurate result. This method makes use of six features which alter with advancing age: attrition, recession of the gingival attachment, diminution of the pulp cavities, the translucency of the apex, the increase in the thickness of the cementum, and the increase in areas of resorption of the root surfaces.

Scott and others (1949), using replicas of enamel surfaces, found that certain changes in the surface details are consistently related to age.

The dentition is of little aid in the determination of sex, and individual teeth have no stigmas of sex at all. The determination of sex from the skeletal remains of sexually immature children is difficult and uncertain, but Hunt and Gleiser (1955) have suggested a method which makes use of the fact that, whereas there is little or no sex difference in the chronology of tooth development, skeletal maturation is about one year earlier in girls than in boys. If the ages of teeth and bone correspond closely, the skeleton probably is male; if the bone age is advanced in comparison with the tooth age, the skeleton probably is female.

*Royal Society of Medicine, 1 Wimpole Street, London W.1, England*

General

### A hand-operated resuscitator

C. G. Trotman and H. W. Whitcher. *Brit.M.J.* No. 5130:1165-1166 May 2, 1959

The ideal resuscitating machine should be simple, portable, sturdy, cheap to manufacture, and designed so that it can be used by untrained personnel; such a machine has been developed by the Ministry of Supply.

The machine (see illustration) consists of three main components: (1) a rubber facepiece, (2) exhalation valve unit and (3) air supply unit. All metal parts are of anodized aluminum, and all rubber parts are of high quality with a life of at least ten years. The components are connected by simple screwed joints so that they can be disconnected for cleaning. The whole apparatus can be sterilized by autoclaving or boiling.

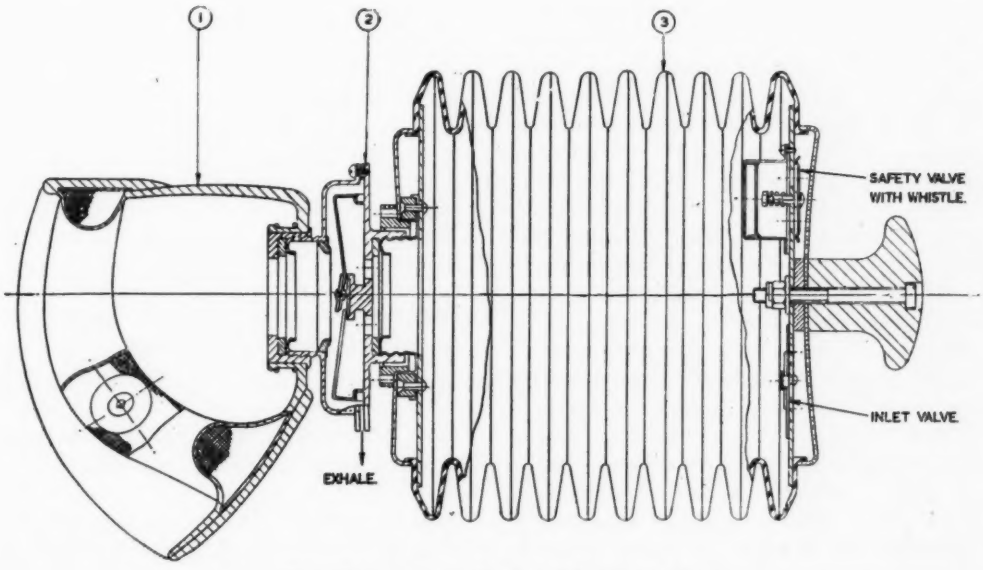
The rubber facepiece consists of an oronasal mask which provides a close pressure-tight fit on as wide a range of faces as possible, and supports the lower jaw. The fit on the face is achieved by an anatomically-shaped pneumatic cushion.

The whole apparatus weighs just under two pounds and is contained in a rigid box measuring 10 by 6 by 6 inches, with a carrying handle. Inside the lid of the box are the following instructions for use of the device.

"1. Place the mask firmly on the patient's face with the lower rim under the chin and the upper rim as high on the bridge of the nose as possible.

"2. Work the bellows steadily at about 16 strokes a minute. The thrust of the bellows should be upwards on the face, so that the jaw is kept up.

"3. Watch the chest. It should rise with each down stroke of the bellows, and fall during each up stroke. If the chest does not rise and fall—First make sure that the mask is tight on the face. Then listen to the bellows during the down stroke. If a whistling noise is heard the patient's throat is blocked and must be cleared. Insert a finger, covered with a handkerchief, down his throat to remove mucus or other obstruction. If the chest rises and falls and the whistle is heard, the pumping is too vigorous. Reduce the force being used.




*General arrangement diagram of the resuscitator*

"4. Continue resuscitation until the patient breathes naturally, or for at least two hours."

The device has been tested during the past eight years, experimentally and clinically, on a large number of unconscious subjects under widely varying climatic conditions, and has been found to be entirely satisfactory.

*University College Hospital Medical School, London, England*

### The dentist's responsibility in diagnosis

Lester W. Burket. *Illinois D.J.* 27:729-733, 760 Nov. 1958

In the field of more comprehensive diagnostic service, the dentist has an unusual opportunity to extend the scope of dentistry as a health service. A comprehensive diagnosis permits the rendering of the needed health services more efficiently and with less likelihood of complications.

The dental profession can take pride in the fact that, for many years, it has sponsored periodic dental or oral health examinations. Patients now take for granted the periodic recall by the dentist. Few physicians utilize a similar recall system. Patients are accustomed to seeing their dentist at frequent, periodic intervals; hence, the alert dentist has an unusual opportunity for the practice of preventive medicine. There are more ill patients walking the streets than there are in the hospitals. When these patients seek dental treatment, they afford the dentist the opportunity of discovering changes in the patient's general health status or in the oral tissues that suggest some systemic disturbance. The patient is provided a more comprehensive health service, and the practice of dentistry is made more interesting. The case finding opportunities in the fields of nutritional and endocrinic diseases, chronic degenerative diseases and diseases of the blood occur in every dental practice.

The diagnosis of soft tissue lesions of the oral mucosa and the associated structures is not beyond the ability of any dentist. It is the responsibility of the dentist to take a complete history of the patient's complaints and to make a thorough examination of the oral cavity and the associated structures, irrespective of the reason for which the patient seeks treatment.

A careful history is the patient's contribution to the diagnosis. The diagnostic value of the history depends more on the skill and perseverance of the examiner than on the patient's education. The history should be taken in the consultation room or in the business office, and not while the patient is seated in the dental chair. Pertinent features of the history should be recorded in writing. After the chief complaint and its history have been recorded, the dentist should question the patient whether any other unusual signs or symptoms in other parts of the body were experienced during onset of the chief complaint. Sufficient time should be devoted to taking the history to indicate to the patient the importance of this phase of the diagnostic procedure. A just fee should be received for diagnostic studies. The too common belief that the dentist is justified in charging a fee only for operative procedures is an indication of dentists' failure to appreciate the importance and value of good diagnostic service.

The second phase of the diagnostic procedure, and one in which the dentists plays the major role, is the examination of the patient. If the data are being recorded by auxiliary personnel, a definite routine for examination should be followed. The lesion or tissues associated with the chief complaint should be examined last. Irrespective of whether lesions are observed within the oral cavity, the lymph nodes of the neck and submaxillary region should be examined in every patient.

A written diagnosis should be entered on the patient's record. The patient should be offered the privilege of conferring with a consultant if he wishes, and the dentist should make his records available to the consultant on the request of the patient.

*4001 Spruce Street, Philadelphia, Pa.*

### Respiratory disorders and peptic ulcers: occupational diseases of dentists

Paul S. Rhoads. *Science Digest* 45:52 May 1959

Dentists are exposed to many microorganisms as they are forced to work at close quarters with their patients. Infections of the respiratory tract such as influenza, bronchitis, viral pharyngitis, viral pneumonia, rhinitis and conjunctivitis are common ailments of dental practitioners.

Another occupational hazard of dentists is peptic ulcer. The development of ulcers in the mucous membrane of stomach or duodenum, caused by a breakdown in the mucosal resistance combined with the erosive action of acid and pepsin, also may result from the nature of the dentist's work. He must be a perfectionist in every detail of examination, diagnosis and treatment. He is confined to a comparatively small space through the long hours of an extremely tedious day, and he is often forced to rush through an inadequate lunch without finding a chance to relax. This strenuous activity undoubtedly invites the gradual disintegration and necrosis of the tissues of stomach and duodenum.

*720 North Michigan Avenue, Chicago 11, Ill.*

**Better dentistry easier**

David A. Hoffman. *North-West Den.* 37:329-331, 337 Nov. 1958

Five years ago the Milwaukee Dental Research Group undertook a time and motion study in dentistry, with the objectives of preserving the dentist's health and increasing his productivity and the quality of his service. Surveys by the group showed a wide variance in efficiency and productivity among dentists. Such variations were the result of the usage of auxiliary personnel, the organization of the practice, the use of time in the office, and the volume of prosthetics.

Dentists, as a group, are subject to occupational overstrain involving the muscles, tendons and joints of the feet, legs and back; dentists have problems involving hypertension, anxiety and exhaustion. The bent neck and back are the most frequent cause of occupational overstrain. To reduce chronic overstrain, the dentist should take daily periodic rest periods. Corrective orthopedic shoes and back supports may be advisable, as may daily exercises, varying the type of work, and occasionally changing the working position to relax the muscles. Although 27 per cent more physical energy is required to stand than to sit while working, only 50 per cent of the dentists surveyed use operating stools.

The dentist can simplify his work by selecting an office procedure, analyzing it, and seeking to improve it by eliminating steps or motions, combining functions, rearranging sequences, substituting, or redesigning equipment and instruments.

A re-evaluation of the dental business office has resulted in a new business system that is 75 per cent more efficient and 95 per cent more accurate than the old system.

The group is redesigning dental operating rooms; this involves a study of basic operating room equipment, the preparatory work area, and the operating room arrangement. Although there has been a tendency to make operating rooms as small as possible, the use of adequate space increases efficiency. The general operating room should have good air circulation and air conditioning. The door should be at the front of the dental chair so that the entering patient need not go through the dentist's or assistant's work areas. Other needs are good general lighting, soundproofing, speakers for soft music, and an intercommunication or light signal system. It is desirable to have adequate space in front of the patient for the patient's purse and for current magazines and dental education material.

*4335 West Fond Du Lac Avenue, Milwaukee 16, Wis.*

**Artificial teeth, an important item in West Germany's export trade**

Paul Holtkamp. *D.Dienst* 10:14 Dec. 1958

After World War II the production of the West German dental industry, especially of artificial teeth, was negligible. After a modest beginning the production of artificial teeth in West Germany was revived to a remarkable degree.

Although at present this item does not compose a significant part of the total foreign trade of West Germany, the continuously increased export to other, mainly European, countries has become an important factor.

The West German Federal Republic, including West Berlin, exported artificial teeth to the following countries (the yearly values converted into U.S. dollars): Austria, $140,000 (1957), $222,000 (1958); Sweden, $147,000 (1957), $220,000 (1958); Italy, $132,000 (1957), $162,000 (1958); The Netherlands, $139,000 (1957), $145,000 (1958); Belgium, $113,000 (1957), $140,000 (1958); Switzerland, $120,000 (1957),

$140,000 (1958); Norway, $72,000 (1957), $81,000 (1958) and Finland, $54,000 (1957), $105,000 (1958).

The total export of artificial teeth to the various countries of the world amounted to $1,630,000 in 1957 and $1,746,000 in 1958.

Compared to these figures, the import of artificial teeth to West Germany is insignificant.

The West German Federal Republic, including West Berlin, imported artificial teeth from the following countries (yearly values converted into U.S. dollars): Switzerland, $54,000 (1957), $74,000 (1958); Great Britain and its dominions and colonies (mainly British West Indies), $23,000 (1957), $71,000 (1958), and the United States, $49,000 (1957), $21,000 (1958).

The total import of artificial teeth from the various countries of the world amounted to $210,000 (1957), $311,000 (1958).

*Schillerplatz 20, Bielefeld, Germany*

### A survey of current dental periodicals—I

T. F. McBride and O. W. Brandhorst.
*J.Am.Col.Den.* 26:51-64 March 1959

A list of 175 dental periodicals published in the United States and Canada has been compiled. Of the 175 publications, 3 are published by the American Dental Association; 42 by constituent dental societies; 68 by component societies; 26 by specialty and auxiliary groups; 19 by dental schools; 5 by fraternities; 2 by other dental associations in the United States; 2 by Canadian dental associations, and 8 are proprietary publications or house organs.

*1984 Northwest Boulevard, Columbus, Ohio*

### Do-it-yourself reline outfit

R. Miller Yardley. *Brit.D.J.* 105:308
Nov. 4, 1958

A "do it yourself" outfit for relining complete dentures is being widely sold. The author recently has seen three patients who had used this product. The outcome was appalling. The resultant improvement was virtually nil, the bites were raised a great deal in each patient, correct occlusion was lost, and the dentures so damaged as to make a normal relining technically difficult and economically impossible. The patients needed new dentures; prior to using these outfits, two of the patients needed their dentures relined and a third required muscle trimming.

The patients thus cost the taxpayer, through the Ministry of Health, substantial sums. In one patient, the mucous membrane of the mouth was badly inflamed, probably a reaction to the relining compound. All three patients expressed bitter disappointment with the results.

The British Dental Association should draw the attention of the Ministry to the consequences of the use of this product.

*24 Bore Street, Lichfield, England*

### Radio transmission through fillings

*J.A.M.A.* 169:1271 March 14, 1959

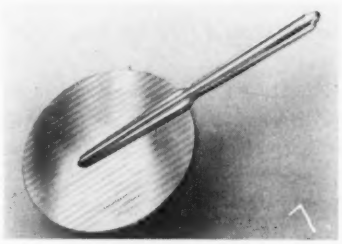
*Q.*—A 32 year old woman who has many silver fillings in her teeth, who is otherwise physically in good health, and whose only diagnosable complaint is a chronic anxiety state, claims that for many years she has been able to hear radio programs even when the radio is not turned on. This occurs from time to time, and if she turns on the local station she finds that what she has been hearing in her ears is the same program that is currently playing. She lives with her husband on a farm, and there is no neighbor's radio nearby. It has been said that occasionally silver fillings can do this sort of thing. Is this legend or fact?

*A.*—When certain metals and their oxides are in a strong signal field of a radio transmitter, rectification may occur with the reception of the signal without the usual receiving equipment. This has occurred from radiators, faucets and electric stove heating units, but never from amalgam restorations. It is assumed that the farm on which the patient lives is not near a powerful radio transmitter. If so, a more intensive study of this unusual complaint should be made to determine whether other members of the household hear these radio programs. If the programs are heard only by the patient, the diagnosis and treatment are obvious. In view of the known anxiety state of the patient, the chief complaint should be evaluated more critically.

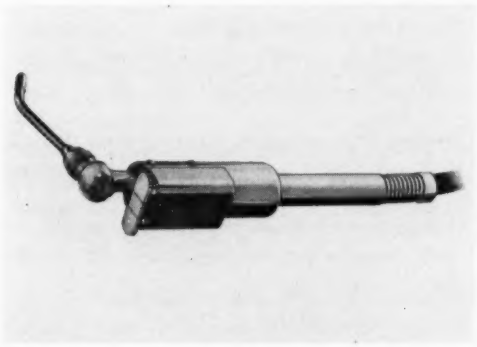
*535 North Dearborn Street, Chicago 10, Ill.*

## New equipment

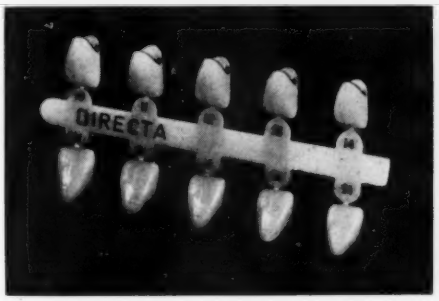
*The information reported here is obtained from manufacturers.* Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*



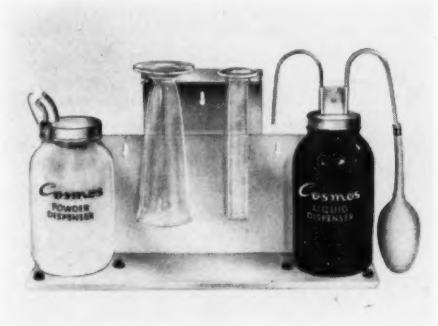
A dental hand mirror has a die-cast chrome handle, a beveled mirror 6 inches in diameter, and a back finished in alternate bright chrome and satin stripes. *Standard Mirror Co., Inc., 151 Milton St., Buffalo, N.Y.*



The new Hanau "Triplex" syringe provides water stream, or air, or an atomized spray, from a single nozzle. Use of the three-in-one syringe is said to reduce the movements of the head, eyes and arms of the dentist. The syringe can be installed in most standard dental units and can be adapted to custom unit installations. *Hanau Engineering Co., 1233 Main St., Buffalo 9, N. Y.*




With "Directa" temporary crowns, no mold chart is needed as each set is in itself an excellent mold guide. The correct crown can be selected in the patient's mouth. Crowns are aligned on the set on a decreasing size scale. Directa crowns are available in opaque or translucent types. Crowns have no unnecessary collars and often can be used without cervical adjustment. If an adjustment is necessary, it can be made with a pair of scissors. Directa crowns, imported from Sweden, are available in a mold guide assortment of 64 different crowns; in a set of 10 assorted central incisors, 12 assorted lateral incisors or 10 assorted cuspids; or in a package of five of any one crown. *Surgident, Ltd., 3871 Grand View Blvd., Los Angeles 66, Calif.*




An acrylic resin dispenser kit consists of a 22 ounce powder dispenser, 625 cc. liquid dispenser, 100 cc. powder graduate, 25 cc. liquid graduate and an aluminum rack. The kit is said to save time, labor and material and to assure accurate measuring. *Cosmos Dental Products, Inc., 43-30 Twenty-second Street, Long Island City 1, N. Y.*

The Jordan separator and matrix retainer separates the teeth sufficiently to enable the operator to restore the teeth to their original conformation, and holds the matrix in contact with the margins of the cavity. *Jordan Engineers, P.O. Box 4913, Jacksonville, Fla.*

## Doctoral and Masters' dissertations

*In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.*

Gingivitis during pregnancy; a clinical statistical study. *Harold S. Elliott. 1959.* M.S.D. *Baylor University.*

Effects of temperature changes on mandible hemodynamics. *Emerson Earl Moore. 1959.* M.S.D. *Baylor University.*

The effect of vitamin D deficiency on tooth development. *Aubrey Joseph Bourgeois, Jr. 1959.* M.S. *Georgetown University.*

Atrophy and regeneration of the submaxillary salivary gland of the mouse. *John Cornyn. 1959.* M.S. *Georgetown University.*

Influence of chip size in heterogenous anorganic cortical bone implants in alveolar defects. *Albert Joseph Wilson. 1959.* M.S. *Georgetown University.*

An investigation to determine the clinical and histologic responses of ash bone implanted in the maxillae and mandibles of dogs. *Joseph Nicholas Annichiarico. 1959.* M.S. *Georgetown University.*

Experimental lathyrism in the albino rat. *Alvin Frederick Gardner. 1959.* PH.D. *Georgetown University.*

A cephalometric study of the positional relationship of the incisors in Class I and Class II Division 1 occlusion. *Tom B. King. 1959.* M.S. *St. Louis University.*

The stability of cephalometric landmarks. *Philip Levens. 1959.* M.S. *St. Louis University.*

A study of the relationship of point A as a cephalometric landmark. *Robert D. Callahan. 1959.* M.S. *St. Louis University.*

A cephalometric comparison of mandibles in Class I and Class II Division 1 with ANB differences of 5 degrees or more. *Lucius F. Cassidy, Jr. 1959.* M.S. *St. Louis University.*

A cephlometric evaluation of Class I discrepancy cases in which four first bicuspids were removed and treated with the edgewise appliance. *Melvin C. Paxton. 1959.* M.S. *St. Louis University.*

A cephalometric and clinical evaluation of Class I discrepancy cases treated by serial extraction. *Joseph Jacobs. 1959.* M.S. *St. Louis University.*

Concepts of extraoral force in orthodontics: Section II. An investigation of unilateral extraoral force. *Charles Dow Miller. 1959.* M.S. *University of Kansas City.*

Orthodontic intermaxillary traction in the treatment of Angle Class II and Class III malocclusions. *George E. Muehlebach. 1959.* M.S. *University of Kansas City.*

The use of cultured calf bone in oral surgery. *Richard S. Alley. 1959.* M.S. *University of Kansas City.*

Apertognathia or open-bite malocclusion. *William M. Benight. 1959.* M.S. *University of Kansas City.*

Orthodontic procedures in closing spaces between teeth. *Bragdon Ray Bowling. 1959.* M.S. *University of Kansas City.*

90-Fluorocortisol and cortisol in relation to mitosis in immature mouse liver. *Angus Ronald Stoesz. 1957.* M.S.D. *University of Minnesota.*

The effects of anticonvulsant drugs, particularly Dilantin Sodium, upon the oral mucosa. *Harold J. Panuska. 1958.* M.S.D. *University of Minnesota.*

Electrolytic polishing of refined dental steels (Das elektrolytische Polieren von zahnärztlichen Edelstählen). *Gerhard Einicke. 1958.* DR.MED.DENT. *Dental School, University of Halle/Saale, Germany.*

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Contents

## Index of authors



### Contributing Abstracters

*Finnish, Russian*
Barbara Kessler, M.D.
T. B. Coolidge, M.D.

*Greek*
Theo. J. Calocassides, D.D.S.

*Japanese*
Masao Onisi, D.M.SC.

*Danish, Norwegian, Swedish*
Gunnar Ryge, D.D.S.
Soren Sorenson, ODONT.D.

*Spanish, Portuguese*
J. J. Barros, D.D.S.
Eloisa DeBarroso
Josefa Thornton
George French, D.D.S., M.D.

*Medical*
A. F. Baranoff, D.D.S.